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

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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 Darence 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, Darijan 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 Darence 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. (planorbilinid type), Rhapydionina malatyensis SIREL, Italkyadina minima (LIEBUS), Fabiana cassis (OPPENHEIM), Chapmanna gassinensis (SILVESTRI), Planorbilina bronnmanni BIGNOT & DECROUZE, Peneroplis sp., Orbiolites sp. and indet. genus (cf. Pilaminella). This limestone sequence containing representatives of the new genus its conformably overlain by hard limestone with Nummulites sp. (N. perforatus group), Alveolina cf. jusformis SOWERBY, F. cassis, Asterigerina rotula (KAUFMAN), Sphaerogypsiina globula (REUSS), Eorupertia sp., Linderia sp., Discocyclina sp. and Acervulina sp.

3. SYSTEMATIC DESCRIPTION

Super Family: Miliolacea EHRENBERG 1839
Family: Riveroinidae SAIDJOVA 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, bisulbiculate, early chambers in quinquelocular arrangement in microspheric form (Pl. I, Figs. 3, 5), but triloculine arrangement in meglospheric form (Pl. I, Figs. 9, 12; Pl. II Figs. 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 periferal 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 quinquelocular stage not observed but adult chambers have a terminal aperture as

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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 quinquelocular 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 SAIĐOVA*). Therefore, the new genus is placed within this family. The Holocene genus *Riveroina BERMUDEZ (BERMUDEZ, 1939)* differs from *Malatyana* in lacking quinquelocular early chambers and trematophore with many openings. The new genus has its quinquelocular 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/I, 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 *Polysegmellina CUSHMAN (CUSHMAN, 1946)* in having a quinquelocular stage in the early ontogeny (Pl. I, Figs. 3, 5, 7-9) instead of a sigmoidine stage; in addition, in the new genus, the chamber cavities are subdivided by longitudinal partitions. *Malatyana* has its quinquelocular early chambers, its planispiral adult chambers and its cribrate aperture in common with *Hauerina d’ORBIGNY (d’ORBIGNY, 1839), Involutohauerina 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 quinquelocular stage and subepidermal partitions. The new genus differs from *Pseudounia uniformis* 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 *Pseudounia uniformis* 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).

**Species Malatyana drobneae, n.g.n.**

**(Pl. I, Figs. 1-15, Pl. II, Figs. 1-10)**

**Derivation of name:** This species is dedicated to Katica Drobnè, 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 Malatyana 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 subshperical, 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 quinqueloquine mode for two whorls (in holotype, Pl. 1, 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 thickness varies 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 Riveroininae by SAIDOV (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 (miliolid, later planispiral patterns), the presence of the adult chambers with subependal partitions and of the cribleate 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 MC CULLOCH. The former (type: Hauerina occidentalis CUSHMAN; CUSHMAN, 1946) was described for the first time from the Holocene of Florida. It has quinqueloquine 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 subependal partitions; the adult test has a complex trematophore with many openings. The latter genus (type: Pseudohauerinella aissidens MC CUL- LOCH; MC CULLOCH, 1977) was reported from the Holocene of Mexico. It has quinqueloquine early planispiral adult chambers with incomplete subependal 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, quinqueloquine arrangement in microspheric) form and more inflated adult chambers with complete subependal partitions. An enigmatic foraminiferan 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 foraminiferan fauna including taxa such as Malatyna drobneae, Hrpydionina malatyaensis, Halkiardia minima, Fabiana cassis, Chapmanina gassnerensis, Planorbulina bronnianni, 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, Fabiana cassis, Asterigerina rotula, Sphaerogypsina globula, Nummulites sp. (N. perforatus group), Linderina sp., Discocyclina sp., Eorupteria sp., and Acervolina sp. There is an abundant microfauna dominated by the group of nummulitines (Nummulites atreus 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 Halkiardia 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).
6. REFERENCES


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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 milliolin 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 whors.
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 Fabiana 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 macroseric test (MA-34).
18, 19 Equatorial sections of macroseric forms (MA-35, MA-36).
20 Axial section of macroseric form (MA-37).
21 Planorbulina brunimanni BIGNOT & DECRUEZ, 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. Pilamininella 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 Orbitalites 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).