DESCRIPTION OF THE SPECIES OF *RHAPYDIONINA LIBURNICA* STACHE, *RHAPYDIONINA MALATYAENSIS* N. SP. AND NEW OBSERVATIONS ON THE GENUS OF *RHAPYDIONINA* STACHE

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ABSTRACT. — The Mesozoic-Tertiary stratigraphy of Konya-Hadım region and Tertiary stratigraphy of Malatya-Darende basin are given. Descriptions are given for the species *Rhapydionina liburnica* Stache and *Rhapydionina malatyaensis* n.sp., the former occurring in samples collected by N. Özgül from Maestrichtian of the Hadım region and the latter occurring in the samples collected by the present author from the Upper Lutetian of Malatya-Darende basin. The genus *Rhapydionina* Stache is discussed in the light of new observations.

STRATIGRAPHY

Hadim region

Özgül (1971) reports Cambrian, Ordovician, Jurassic, Cretaceous and Tertiary rocks of the Hadim association from the Konya-Hadım region. Hadim association crops out in two separate tectonic fensters, one situated to the north and the other to the south of Hadim county (N. Özgül, 1971, 1973). These two fensters are about 1 km apart. Cenomanian limestone characterized by foraminiferas, such as *Pseudolituonella reicheli* Marie, *Pseudedomia viallii* (Colalongo), *Cuneolina* sp., *Dicyclina* sp., forms the lower part of the sequence in the southern fenster (Fig. 2a). Maestrichtian limestone containing Rudistacea and foraminiferas, such as *Rhapydionina liburnica* Stache, *Laffitteina* cf. *marsicana* Farinacci, *Cuneolina* sp., *Dictyoconus* sp., overlies disconformably the Cenomanian limestone. It contains pebbles of the Cenomanian limestone in its basal part. Tertiary limestone and flysch take place over the Maestrichtian limestone. Limestone of the Malm age, containing *Pfenderina* cf. *trochoidea* Smout & Sugden, *Kurnubia* sp., *Clypeina* sp., forms the lower part of the sequence in the northern fenster (Fig. 2b). A conglomerate containing pebbles of the Cenomanian limestone and a Rudistacea-bearing Maestrichtian limestone with *Orbitoides media* (d'Archiac) and *Siderolites* sp. cover disconformably the Malm limestone. Tertiary sediments in lithologies similar to that of the southern fenster take place over the Maestrichtian limestone. The difference in microfauna of Maestrichtian limestone of two fensters very closely located to each other, one containing *Rhapydionina liburnica* Stache and the other containing *Orbitoides,* is solely due to the difference in the environmental characteristics. The present author believes that these two limestones with different microfauna are laterally transitional.

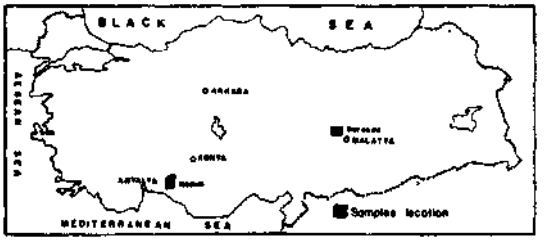

Fig. 1 - Location map.

Darende region

Rock units of Malm, Cretaceous, Tertiary and Neogene ages crop out in the Darende region. Lutetian is very nicely exposed to the north of the region. It is composed of conglomerate, marl

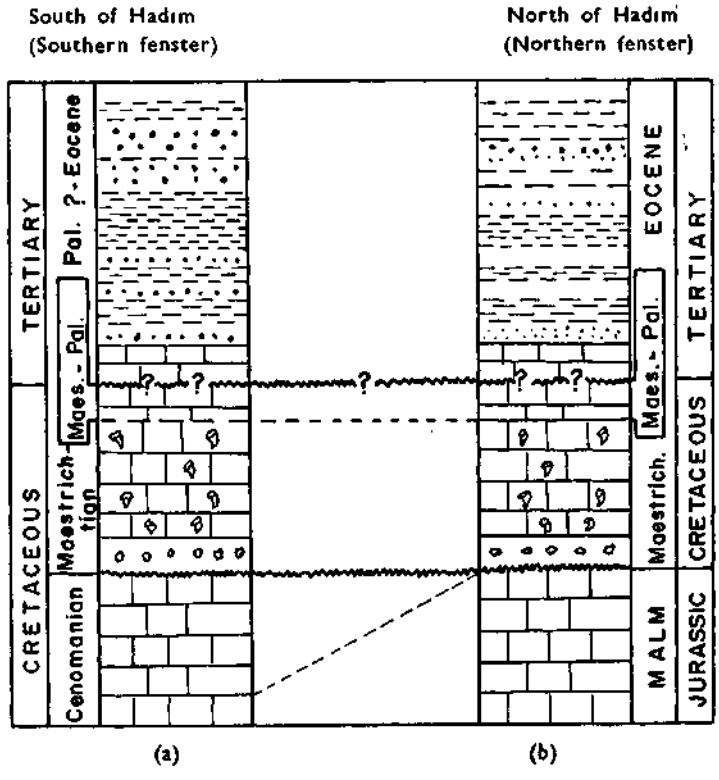

Fig. 2 - Schematic columnar section of the southern and northern fensters (based on the oral conversation with N. Özgül).

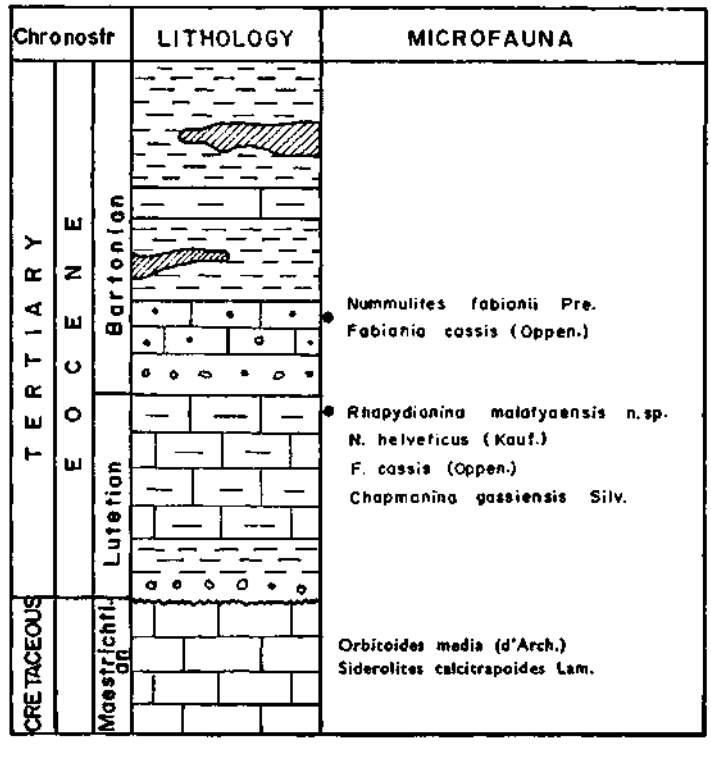

Fig. 3 - Schematic columnar section from the Darende region.

and clayey limestones, all overlying disconformably the limestones containing *Orbitoides* and *Siderolites.* Limestones of the upper part contain foraminiferas, such as *Rhapydionina malatyaensis* n. sp., *Nummulites helveticus* Kaufmann, *Fabiania cassis* Oppenheim, *Halkyardia minima* (Liebus), *Chapmanina gassiensis* Silvestri and *Orbitolites* sp., in large amounts. Lutetian is overlain by conglomerate, sandstone, sandy limestone and marl showing gypsum intercalation, all being Bartonian in age. The conglomerate unit contains pebbles of limestone with *Rhapydionina malatyaensis* n. sp. *Nummulites fabianii* Prever, *N. incrassatus* de la Harpe, *Fabiania cassis* Oppen., *Chapmanina* sp. are in the clayey limestone fraction of the sequence.

SYSTEMATIC DESCRIPTION

Order: FORAMINIFERIDA

Family: PENEROPLIDAE

Genus: Rhapydionina

Rhapydionina liburnica (Stache) 1913
(Pl. I, fig. 1-8; Pl. II, fig. 1-10)

1880 — *Peneroplis liburnica* n.sp., Stache, p. 199.

1889 — *Peneroplis liburnica* n.sp. (var. *acanthica, strangulata* and *laevigata),* Stache, pl. Va, fig. 20-23.

1889 — *Peneroplis protocaenica* n.sp., Stache, pl. Va, fig. 25, 26, 28, 34; pl. VI, fig. 14-17.

1889 — *Peneroplis rostrata, n.* sp., Stache, pl. Va., fig. 27; pl. VI, fig. 13.

1913 — *Rhapydionina liburnica* (Stache), Stache, pl. 26, fig. 5-5a.

1959 — *Sutivania likvae* n.sp., Radoicic, p. 87, pl. 1, fig. 1-3.

1960 — *Sutivania likvae* Radoicic, Radoicic, p. 67.

1963 — *Rhapydionina liburnica* (Stache), Pavlovec, p. 436.

1964 — *Rhapydionina liburnica* (Stache), Loeblich & Tappan, p. 493, fig. 379.

1965 — *Rhapydionina liburnica* (Stache), Farinacci, p. 1251, pl. 317, fig. 1-3.

1971 — *Rhapydionina liburnica* (Stache), Bignot, p. 222, pl. 2, fig. 1-16; pl. 3, fig. 1-10.

Description.— Macrospheric form: Test is free, porcellaneous, early chambers are well developed and have a planispiral coiling. Later chambers are arranged uniserially. Serial stage is conical to sub-cylindrical in shape. Proloculum is spheric and rather big, with a diameter of about 55 m. Flexostyle is visible in some sections. The chambers are involute in the planispiral stage. The planispiral coiling stage has one whorl containing 4-5 chambers. The serial chambers are about 9-11, their width is always greater than their height. Chambers are partially divided by numerous transverse partitions. Cribrate apertures are at the end of each uniserial chamber.

Measurements (in mm):

	Maximum	*Minimum*	*Average*
Length	1.40	0.68	1.02
Diameter of the uniserial chamber	0.68	0.41	0.54

Microspheric form: They are found rather rarely compared to the macrospheric forms. Planispiral coiling is not seen in the sections studied. Uniserial stage is well developed and contains about 18 chambers. Transversal partitions can be seen clearly in the sub-axial sections. Other characters of the microspheric forms are the same as in the macrospheric forms.

Measurements (in mm):

	Maximum	*Minimum*	*Average*
Length	4.89	3.76	4.32
Diameter of the uniserial chamber	0.96	0.82	0.89

Locality. — Konya-Hadım, Çobanağacı village.

Stratigraphic level. — Maestrichtian.

Rhapydionina malatyaensis n.sp.
(Pl. III., fig. 1-10)

Derivatio nominis. — Malatya, a city from the Eastern Turkey.

Holotype no.— Es. M.1, paratype no. Es.M.2 - Es.M.10. The specimens are deposited at the Paleontological Section of the Mineral Research and Exploration Institute of Turkey, Ankara.

Diagnosis. — Test elongated cone, microgranular imperforate calcareous, with four planispirally coiled and not well developed chambers, proloculum rather large, average diameter 140 m, serial chambers number about 20-38 with rounded cross section, very regular and spaced transversal partitions, with dimorphism, cribrate apertures.

Description.— Macrospheric form: Test is an elongated cone, microgranular imperforate calcareous. Proloculum is spheric, rather big, diameter of megalosphere varies between 122-158 m, it has a flexostyle. The number of planispiral chambers which follow the proloculum is four; uniserial chambers are very compressed. Their cross sections are rounded, their number is about 20. In all sections (except apertural) perpendicular to the serial axis, there is a central cavity which can be well seen. Uniserial chambers are divided by transversal partitions which are well developed and arranged with rather large intervals. Cribrate apertures are at the end of each uniserial chamber.

Measurements (in mm):

	Maximum	*Minimum*	*Average*
Length	2.41	1.06	1.68
Diameter of the uniserial chamber	0.51	0.72	0.61

Diameter of the holotype is 2.07 mm.

Microspheric form: The shape is elongated cone. They are found rather rarely compared to the macrospheric forms. Planispiral coiling is not seen in our samples. Uniserial chambers are well developed and their diameter increases gradually towards the final chamber. 38 uniserial chambers were counted in one adult specimen. Transversal partitions are regular and arranged with large intervals. Aperture is cribrate.

Measurements (in mm):

	Maximum	*Minimum*	*Average*
Length	4.14	3.55	3.84
Diameter of the uniserial chamber	0.86	0.34	0.60

Comparisons and remarks. — It differs from *Rhapydionina urensis* Henson by having a less developed planispiral stage and by fewer number of planispirally coiled chambers. It also differs from *Rhapydionina limbata* Van den Bold by its greater length, by its bigger proloculum and by having more spaciously arranged partitions.

Locality. — Malatya, north of Darende.

Stratigraphic level. — Upper Lutetian.

NEW OBSERVATION ON THE GENUS *RHAPYDIONINA* STACHE

Characteristics of the genus, species and subspecies were not given in detail for *Rhapydionina* which was first described by Stache in 1912. In view of this fact it is our belief that there are some new genera, very similar to the genus *Rhapydionina,* but described under different names.

Van Wessem (1943) described the new genus *Praerhapydionina.* He differentiated it from *Rhapydionina* pointing out the existence of only one central aperture. In the transversal sections of uniserially arranged chambers of *Rhapydionina liburnica* (Stache) that we have studied, sections similar to cribrate aperture and sometimes sections similar to single aperture can be seen (pl. I, fig. 4, 5, 6). The same situation can also be observed in *Rhapydionina urensis* Henson (1948, pl. 16, fig. 21). Bignot (1971) gave schematic drawings representing this fact. This aspect is produced when a section crosses through apertural region or central cavity. We believe that this difference in aperture is not an adequate criterion to make a new genus, because Wessem studied *Praerhapydionina* only in thin sections. Our view is supported by the fact that all other genus characteristics of *Praerhapydionina* are the same as those of *Rhapydionina.* Consequently, *Praerhapydionina cnbana* van Wessem (type-genus of *Praerhapydionina)* is a species of *Rhapydionina.*

The same reasoning must also be true for Henson's *Praerhapydionina delicata* of Oligocene age and for *Praerhapydionina hnberi* of Upper Eocene age, because Henson, too, worked on thin section only and he did not clearly observe the apertural region.

Haurania looks like a synonym of *Rhapydionina* by having planispiral coiling of the early chambers, uniserial arrangement of the following chambers being conical in shape and by the presence of transversal partitions and cribrate aperture. A distinction between genera *Haurania* and *Rhapydionina* based on different wall structure of Paleogene *Rhapydionina* (imperforate microgranular calcareous) will be erroneous. This difference in wall structure is probably caused by environment conditions. The present author shares the opinion of Loeblich and Tappan (1964), who synonymized *Haurania* with *Rhapydionina.* Consequently, the species *Haurania deserta* Henson and *H. amiji* Henson must be the primitive species of the genus *Haurania.*

As stated by Farinacci (1965) and Bignot (1971) *Sutivania likvae* Radoicic is a synonym of the microspherical form of *Rhapydionina libnryica* (Stache).

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PLATES

PLATE - I

Rhapydionina liburnica Stache
(Macrospheric form)

Fig. 1 — Equatorial section, slightly oblique, x 41.

Fig. 2 — Suhequatorial section, x 40.

Fig. 3 — Equatorial section, slightly oblique, x 45.

Fig. 4-8 — Sections normal to the uniserial stage axis:

4 — Section through apertural region, x 35.

5 — Section through apertural region, x45.

6 — Section through apertural region, slightly oblique, x 50.

7-8 — Sections through a uniserial chamber, showing central cavity, x 49.

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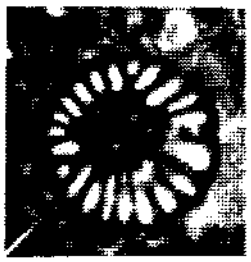

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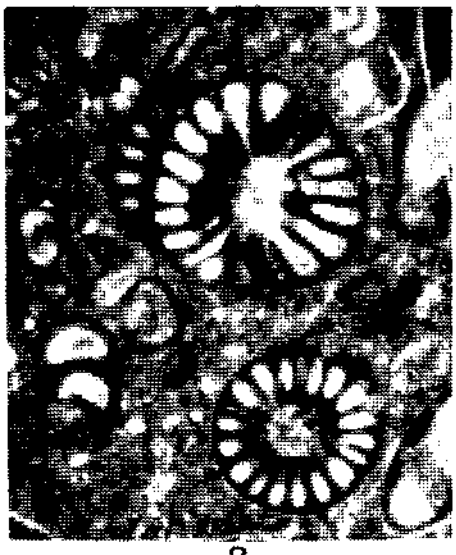

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PLATE - II

Rhapydionina liburnica Stache

(Macrospheric form)

Fig. 1 — Suhcquatorial section, x 33.

Fig. 2 — Suhequatorial section, showing planispiral chambers, without transversal partitions, x 65.

Fig. 3 — Tangential sections of uniscrial stage, x 46.

Fig. 4 — Equatorial section, slightly ohligue, x 55.

Fig. 5-6 — Suhequatorial sections of juvenile forms, x40.

(Microspheric form)

Fig. 7 — Parallel section to uniscrial stage axis, x18.

Fig. 8 — Parallel section to uniserial stage axis, x 41.

Fig. 9 — Oblique section to the uniserial stage axis, x49.

Fig. 10 — Oblique section to the uniserial stage axis, x43.

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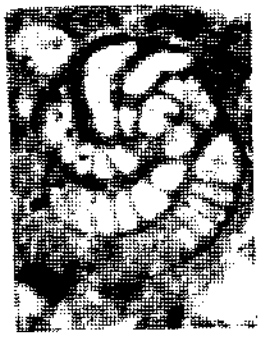

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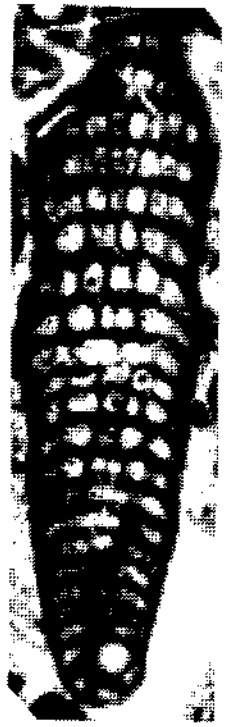

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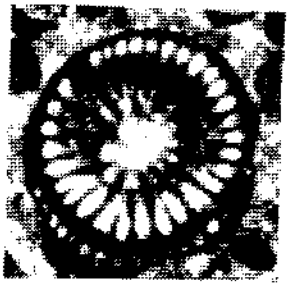

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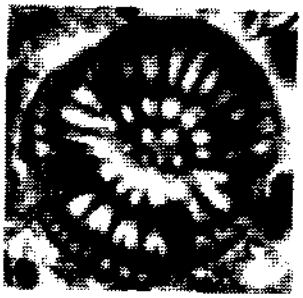

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PLATE - III

Rhapydionina malatyaensis n.sp.

Fig. 1 — Equatorial section, macrospheric form, holotype, x43.

Fig. 2-5 — Oblique sections through uniserial chambers, paratypes:

2-3 — Macrospheric forms, x45.

4-5 —- Microspheric forms, x 43

Fig. 6 — Parallel section to uniserial stage axis, microspheric forms, paratype, x 44.

Fig. 7 — Parallel section to uniserial stage axis, microspheric forms, paratype, x 26.

Fig. 8 — Probably an axial section, according to spiral coiling axis, macrospheric form, paratype, x54.

Fig. 9 — Parallel section to uniserial stage axis, microspheric form, paratype, x40.

Fig. 10 — Section normal to the uniserial stage axis, macrospheric form, paratype, x57.