A NEW GENUS AND TWO NEW SPECIES OF RUDISTS FROM HATAY, TURKEY

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ABSTRACT. — Descriptions of new genus *Hatayia* n. gen. and two new species *Lapeirousella anatolica* n.sp., *L. yalazensis* n.sp. from the Maastrichtian strata of Hatay, Southern Turkey, are given. A brief description of regional stratigraphy and fossiliferous formation are also given.

INTRODUCTION

The aim of this work is to study of Rudistid fossils collected from Cretaceous levels of Hatay region and to correlate them with the associated microfossils. Results of this study give us new data on the stratigraphy and paleontology of the region. Rudistids collected from Yayladağı, Hatay, Southern Turkey by Haluk Sel9uk, contain a new genus, *Hatayia* n. gen. *(H. spinosus* n. gen. n. sp.) of the Radiolitidae family and Joufiinae subfamily. This new genus is associated with new species of Lapeirousella Mil. *(L. anatolica* n. sp., *L. yalazensis* n. sp). This new fauna is found with *Orbitoides media* (d'Arch.), *0. apiculata* (Schlumb.), *Omphalocyclus macroporus* (Lam.), *Siderolites calcitrapoides* (Lam.) and *Globotruncana* spp. as microfossils which indicate Maastrichtian age.

Stratigraphic portion of the work is prepared by H. Selçuk and paleontologic portion by N. Karacabey-Öztemür.

STRATIGRAPHY

Bibliography of previous works related to the geology of region and results of detailed geological investigations are given in another work (Selçuk H., 1980). In this section stratigraphy of the investigated area and the Rudistid bearing formation are summarized (Fig. 1).

Different lithologies, formed in various environments have been observed in the region. Tectonically controlled formations, have been studied under three groups:

Basement

It is generally represented by shelf sediments of Upper Jurassic (Malm)-Upper Cretaceous (Santonian) ages. These formations show lateral and vertical continuity and there is no unconformity between them. The lithology is homogenous, except local facies varieties. Sedimentary environment, reveals carbonate shelf facies, belong to the Arabian platform.

Allochtonous ophiolitic complex

It is originated from upper mantle and oceanic crust. Ophiolitic complex of Kızıldağ has been overthrusted on the autoctonous basement. This event took place in the Lower-Middle Maastrichtian age.

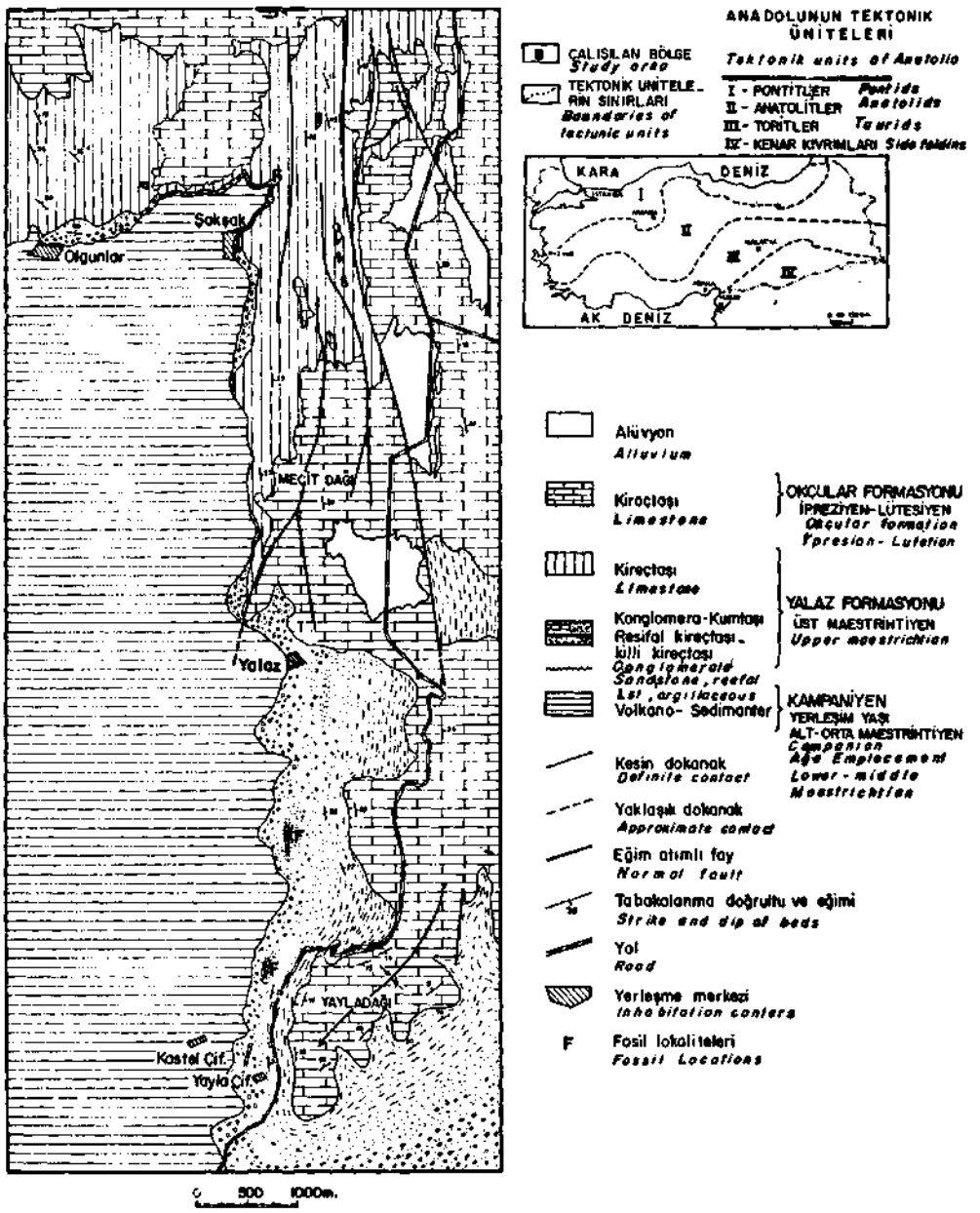

Fig. 1 - Geologic map of the region.

Yalaz Formation: It is clearly observed near Yalaz village, and also observable at Yayla Çiftliği, Şakşak köy and around Olgunlar koy. The lithology is composed of basal conglomerate which is vertically and laterally transitional to sandstone. In places, they can alternate each other or sandstone can make lenses or wedges in to conglomerate. There is a sandy limestone horizon at this level, because the sediment is rich in $CaCo_3$. Rudistid fauna collected from this sandy limestone horizon are *Pironaea syriaca* Vautrin, *P. corrugata* Woodward, *Vautrinia syriaca* (Vautrin), *Sabinia* aff. *klinghardti* Boehm. The specimens of Hatayia and Laperousella are collected from conglomeratic parts of the Yalaz Formation (Fig. 2). The conglomerate passes upward to the sandstone which is rich in micro and macrofauna. The microfauna identified are as follows: O*mphalocyclus macroporus* (Lam.), *Orbitoides media* (d'Arch.), O. *apiculata* (Schlumb.), *Siderolites calcitrapoides* (Lam.), *Lepidorbitoides socialis* (Leym.), *Globotruncana stuarti* de Lapp., *Rotalia* sp, *Loftusia* sp. The limestone bands of 3-8 cm thick take place on the upper part of the sandstone. These limestone bands are laterally transitional and vertically conformably overlain by a different limestone argillaceous limestone and marl seguence. The microfauna contents of this level is as follows: *Globotruncana mayaroensis* Bolli, *G. gansseri* Bolli, *G. area* (Cushman). The age of the formation, after the above mentionned microfauna, is Upper Maastrichtian. Total thickness of the formation range between 100-300 meters. Upper contact of the Yalaz Formation is conformable with Paleocene sediments, but in places Eocene sediments overlie it unconfortibly mity (Selçuk, 1980).

SYSTEMATIC PALEONTOLOGY

Order : Rudistida Lamarck, 1819

Family : Radiolitidae Gray, 1848

Subfamily : Joufiinae Karacabey-Öztemür, 1980

Genus : *Hatayin* n. gen.

Derivatio nominis : After the name of the city of Southern Turkey, Hatay.

Genoholotype : *Hatayia spinosus* n. gen. n. sp.

Type locality : Yalaz Formation, south of Yalaz village, Yayladağı, Hatay.

Type level : Maastrichtian.

Diagnosis: Upper valve capuloid, inclined toward cardinal region, with very eccentric summit. Shell wall of three layers: outher lamellar, middle and inner layer with very thin, long and fusiform pseudocanals.

Lower valve conical, external lamellae extending upward, sometimes slightly inclined toward exterior, strongly undulated, surface ornamented with strong and numerous longitudinal costae. Siphonal bands defined by two very strong costae bearing strong and rough spines oriented upward. Interband, as rather deep and large groove. In transversal section, the shell wall being prismatic in texture with thin polygonal cells. Special texture at the siphonal bands depending to the lamellar structure. Ligamental ridge very thin and long.

Comparison's: *Hatayia* n. gen. resembles to *Colveraia* Kling. with the forms of the pseudocanals in the upper valve and with rib formed siphonal bands on lower valve. But it differs from *Colveraia* by its upper valve inclined toward ligamenial ridge (contrary case in *Colveraia),* and the siphonal ribs are not located within the siphonal grooves and having rough spines on these ribs (Milovanovic, 1937; Moore, 1969; Karacabey-Öztemür, 1974):

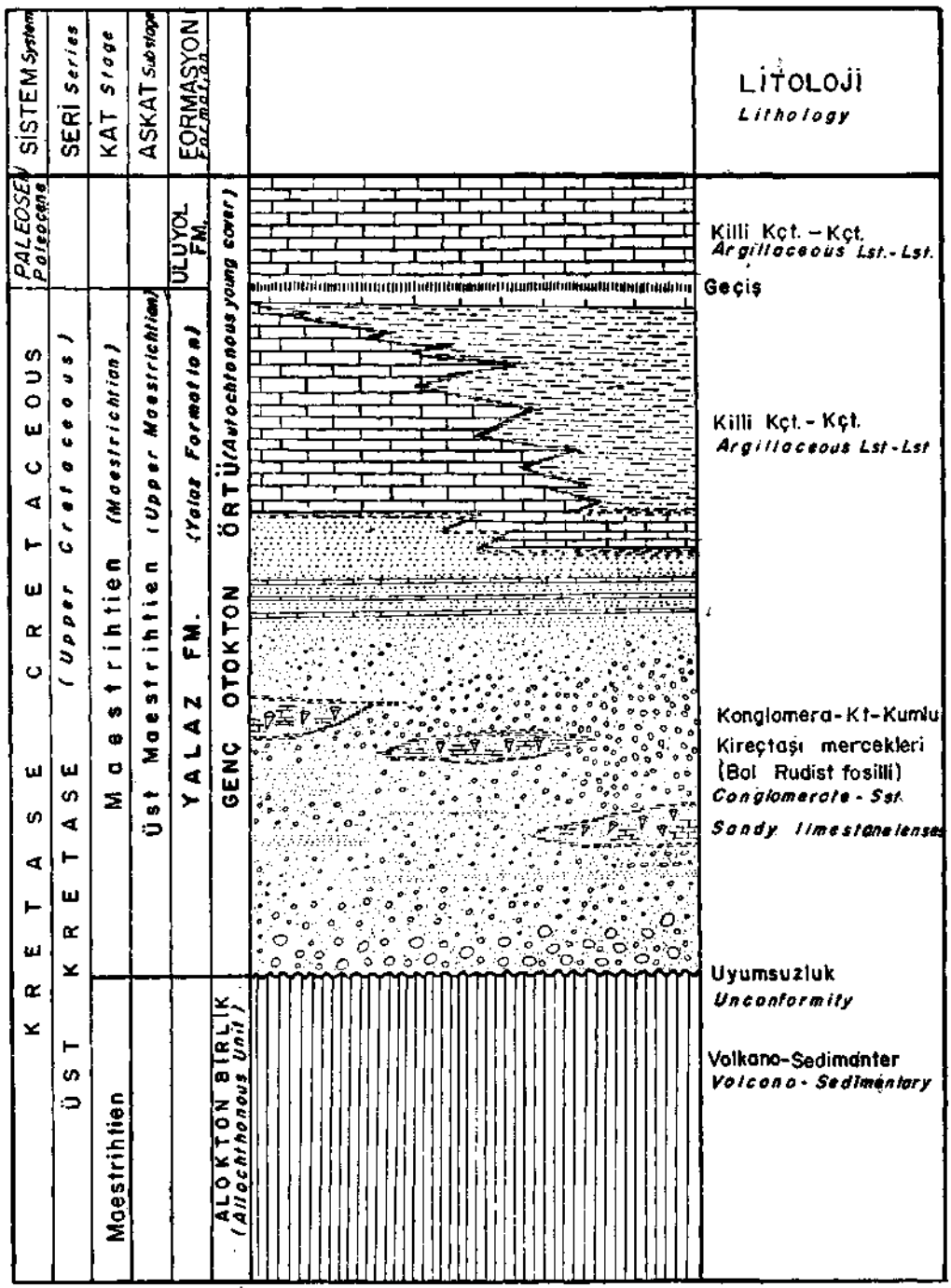

Fig. 2 - Columnar section of the Yalaz Formation.

It resembles to *Balabania* Kar.-Özt. by the upper valve inclined toward ligamental region and having pseudocanals, but it differs from Balabania by the ribbed siphonal bands and the ligamental ridge being very thin, long and without enlargement at the end (Karacabey-Öztemür, 1980).

Hatayia spinosus n. gen. n. sp.

(Fig. 3; Plate I, fig 1-4; Plate II, fig. 1)

Derivatio nominis: Having spines on the siphonal ribs.

Material and Depository: Holotype with lower and partly used upper valve and three paratypes. Holotype is deposited at the Museum of Mineral Research and Exploration Institute of Turkey with no. 1248.

Type Locality: Yalaz Formation, south of Yalaz village, Yayladağı, Hatay.

Type level : Maastrichtian.

Description: Conical lower valve slightly curved toward ligamental region. The height of the cone is 5 cm at the siphonal side and 7.5 cm at ligamental side. On the anterior face, the rows of the lamellae are irregularly imbricated upward, in form of «cornet emboite debordant», and all around these lamellae, the periphery is strongly plicated. These plications cause longitudinally aligned ribs which are wider than the grooves. On the posterior the outer lamellae are more straight and tightly imbricated. Siphonal region can easily be distinguished. Two, thick and subequal ribs mark the E and S siphonal bands. On these ribs the outer lamellae form very rough, acute and rather long (the broken, end estimate this adjective) spines. The number of these spines, on each rib, is about 9-10. Interband is wide and rather deep groove. It measures 2.5 cm at commissure. Three rows of small longitudinal ribs are observed within this groove, and they are transversed by the outer lammellae. The narrow and longitudinal groove at cardinal region marks the ligament. The diameter of the subcircular cross-section of the lower valve, at commissure, is 4.5 X 5 cm. The thickness of the shell wall is about 0.5 cm. The prismatic structure of the outer layer is composed of small polygonal cells. This polygonal structure shows reticulate pattern inward and radially arranged cells outward. In some places, at the inner part of the longitudinal grooves, vase patterns formed by the lamellae have been observed. This abnormal pattern due to the strong plications of the limb. Ligamental ridge is well developed. Very thin and long ligamental ridge is composed of a triangular base and broken two pieces. More well protected ligamental ridge shows 0.6 mm width and 7 mm long in paratype. There is no any enlargement at the end of it. In holotype, the ligamental suture line is composed of one row of elongated cells. E and S siphonal bands, in form of triangle in section, show different internal structure. The outer contour of E and S bands are followed inward by several parabolic pattern of lamellae. Elongations of the outer arch touch the inner border. The followings do not reach the inner border and end by touching the previous arch; so the archs are wider inward, which end as a circle at center. At E band, the inside of the circular structure is made of polygonal cells, but at S band these cells are radially elongated prisms as between the archs. The texture is regulate polygonal cells between circular

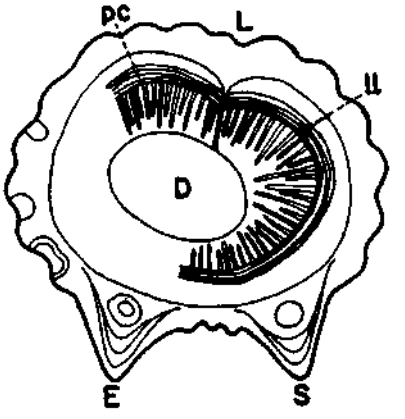

Fig. 3 - *H. spinosus*, cross-section of the lower valve (schematic).

structure and inner border of both bands. This circular structure remember the cylindrical siphonal structure of Medeella (Polsak, 1967). There is no bulges on the inner border opposing the E and S bands. The texture of the interband is made of polygonal cells.

Upper valve, in paratype, being capuloid, inclined toward ligamental area and the summit reaches to the 1/4 of the diameter. Siphonal region is flat or slightly concave; toward center a sudden uplifting forms a cone. The outer lamellar layer being eroded inplaces let crops out of the radial pseudocanals. In transversal section of the paratype, an outer lamellar layer of 4 mm thick and inward a middle layer with 0.7 mm and a third inner layer of pseudocanals have been observed. These very thin and long fusiform pseudocanals are radially arranged and reach to the border of the body cavity. In holotype, these pseudocanals are also arranged in one row, but at cardinal region it seems to be two rows. In fact, in paratype, the well preserved cardinal region shows one row of 1 cm long rather thick pseudocanals. Cardinal apparatus has been observed only in paratype. B, B'cardinal teeth are subsquare, massive and located symiretrically on both sides of the L. B is more smaller than B'and more closer to the inner border of the shell wall. Only mp is preserved. It is long with denticulate border and reaches up to E.

Subfamily: Lapeirousiinae Kühn, 1932

Genus: Laperiousella Milovanovic, 1938

Lapeirousella anatolica n. sp.

(Plate II, fig. 2-4)

Derivatio nominis: After the old name of Anadolu, Anatolia.

Material and Depository: Holotype with broken upper and lower valve. Holotype is deposited at the Museum of Mineral Research and Exploration Institute of Turkey with no. 1224.

Type locality: Yalaz Formation, south of Yalaz village, Yayladağı, Hatay.

Type level: Maastrichtian.

Description: Lower valve is preserved up to 2.5 cm from the commissure, general shape should be conical. The outer lamellae are uprighted and closely plicated at posterior, but they are horizontal or nearly recurved downward at anterior. The surface of these lamellae are ornamented with thin but marked longitudinal costae. Compressed and used anterior region shows only costae prints. Siphonal region is well marked. E and S siphonal bands are very different with their shapes and sizes. E band lies within the siphonal groove, being large and with a convexity reaching the same level of the outer lamellae. It is 8 mm large at commissure and transversed by outer lamellae. It is ornamented with very thin longitudinal costules of 8-9 in number. The S band is occluded completely by outer lamellae directed upwards and marked exteriorly as a longitudinal groove. The interband, being large (15 mm) and convex, contains horizontal and tight growth lamellae. These lamellae are also closely plicated to form 8 costae thinner than the peripheral costae. Because of the compression at anterior region the shape of the transversal section is oval. The thickness of shell is very different; near E it is 6 mm but near S it is 16 mm. The outer layer, being prismatic in structure, is composed of polygonal cells. The cells are in reticulate texture toward exterior but become radiating toward body cavity. This radially arranged part form the main part of the outer layer. The cells of the radiating part do not show remarkable elongations along this radiation. The inner part of the prismatic layer is composed by regularly plicated lamellae. In this part, the radial prismatic cell walls are thick and towards periphery they become thinner to form the walls of the normal prismatic cells.

At the inner border of the shell two slight convexities mark E and S pseudopillars on the siphonal region. E pseudopillar is rudimentary. It is a very slight convexity at the body cavity. E is distinguished laterally from the prismatic structure with a thin wall formed by the thickening of the walls of the cells. These walls disappear near the top of the pseudopillar. There is no lamellar zone at the top. The cells of the pseudopillar are more bigger than the others and tending to form radiate rows. E pseudopillar is not covered by the outer lamellae outward and E groove is open, denticulate outer border of the pseudopillar forms E band. S pseudopillar is more developed than E. It is trapezoidal in form but it lost its original form due to the compression. This pseudopillar is more proeminent at the inner border, and contrary to E, is completely covered by the outer lamellae. Suture line, as a very thin fissure, connects this pseudopillar with exterior. Two thin walls separate S pseudopillar from prismatic layer. These walls pass to lamellar zone at the top. This lamellar zone is slightly concave at its middle and probably parallel to the inner border, because it is deformed by compression. The lamellar zone is covered outward by a thin lacuna. Prismatic texture of the pseudopillar is formed by uniform polygonal cells. Cardinal apparatus can not be seen.

Upper valve is convex, the only preserved part of the shell is siphonal region which is lamellar. The E band, being narrower than the lower valve, continues from the periphery to the summit as a costa.

Comparisons: *Lapeirousella anatolica* n. sp. distinguished from *L. orientalis* Mil. by rudimentary form of E and by the uniform cell texture of S pseudopillar (Milovanovic, 1951). It is distinguished from *L. remetiana* Lupu by the less convexities of the E and S pseudopillars in the inner border and by more rudimentary structure of E pseudopillar (Lupu, 1969).

Lapeirousella yalazensis n. sp.

(Plate II, fig. 5-7)

Derivatio nominis: from the locality name, Yalaz.

Material and Depository: Holotype with two valves. Holotype is deposited at the Museum of Mineral Resaerch and Exploration Institute of Turkey with no. 1246

Type locality: Yalaz Formation, south of Yalaz village, Yayladağı, Hatay.

Type level: Maastrichtian.

Description: Lower valve is conical with 5 cm height and having 5.5 cm antero-posterior diameter at commissure. It attached by the considerable part of the anterior side to a foreign shell which makes flat this part of the shell (Plate II, fig. 7), so that the siphonal region on the opposite side is convex. The outer lamellae are more or less horizontal with fine radial plications, but they turn up sharply in the parts corresponding to the siphonal bands and form two peaks which rise above the shell surface of the upper valve and they turn upwards at the attachement area. The siphonal bands are in different shapes and sizes. Flat and large E band is located in the base of siphonal groove. It is transversed by the lamellae and ornamented by several thin and longitudinal costal: The outer lamellae, which border the siphonal groove, are in places tending to overlap on the siphonal groove; so the width of this'groove vary between 4-7 mm along of it. S band occluded by the lamellae directed upwards and marked exteriorly as a longitudinal trace. Interband is rounded and have 20 mm of width. It is composed of plicated lamellae which are slightly turned downward. In cross-section, passing 1 cm below the commissure, the body cayity is subcircular. The thickness of the shell wall, at the siphonal region, varies between 3-5 mm, but it attains up to 10 mm at the region of attach-

ment. The outer layer is composed of radiating secies of small polygonal cells with thin wall. These radially arranged cells are not radially elongated and are bifurcated 3-4 times towards periphery to form new series. This position is well observed at siphonal area where the single or double cell series are separated by radial, straight and thick lines which are formed by the thickening of the lateral walls of the cells. These radially arranged cells can reach the periphery or rarely become reticulate pattern. The outer lamellae covering the pseudopillar S have also a reticulate texture. The inner part of the prismatic layer, looks like *L. anatolica*, but plicated lamellae are more thicker. Two slight and large convexity mark the E and S pseudopillars at the inner border. Low trapezoidal shaped E pseudopillar is separated from the outer prismatic texture by the walls formed by the thickening of the lateral walls of polygonal cells. The wall at the side of the interband is thicker 3-4 times than the other. The lateral walls of this pseudopillar pass to the lamellar zone which is long and slightly arched toward inner border to which it is parallel. The pseudopillar is composed of small, thin, polygonal cells forming reticulate texture. The denticulate outer border of this lamellar zone forms the E band. The S siphonal band is in high trapezoidal shape. The inner border convexity is nearly equal to the E convexity, but it is more shorter. The lateral walls separating the S pseudopillar from the prismatic texture are not well marked as E, they are formed by the assemblage of the thick walled cells. The lamellar zone at the top of these walls is massive and nearly parallel to the inner border. The S pseudopillar, is completely covered by the outer lamellae. The outer part of the lamellar zone is covered by very thin lacuna which is open to the exterior by a short fissure. The pseudopillar texture is composed of small polygonal cells tending to be arranged radially. Cardinal apparatus cannot be observed.

The convex upper valve is rather used. E and S siphonal bands, being as two high costae, lie from the periphery up to the summit. As the S siphonal groove being completely occluded by the outer lamellae at the lower valve, an osculum must be present at the upper valve, but we could not observed.

Comparisons: *Lapeirousella yalazensis* n. sp. resemble to *L. anatolica* by the characteristics of the outer lamellae of the lower valve, by the compressed and large attachement surface and also by the S pseudopillar structure; but it differs from anatolica by the rather convexity of the E and S pseudopillars, by the flat and partly observable E band in spite of convex and open E band at *L. anatolica* and also by the pseudopillar which is rather well developed contrary to *L. anatolica* in which E pseudopillar is rudimentary.

These two new species of *Lapeirousella* resemble to genus *Thyrastylon* Chubb by the external characteristics and by the structure of the siphonal region (Douville, 1904; Chubb, 1956; Sladic-Trifunovic, 1972): E band large and ornamented with thin costules, S band, exteriorly seen as a trace, is occluded by the outer lamellae, and by having two peaks formed by the rising up of the two bands towards the upper valve. These characteristics are the common features with *Thyrastylon.* But they differ from *Thyrastylon* by the trasversal section of the lower valve in which the prismatic layer is composed of polygonal cells in spite of quadrangular as in *Thyrostylon.* and also by the presence of pseudopillars in new species.

On the other hand, the new species have radially arranged polygonal cells and less developed pseudopillars which are the characteristics of *Lapeirousella* (Milovanovic, 1951). Only, the radially arranged cells are not elongated in radial direction as in *Lapeirousella.*

In conclusion, the two characteristics of (polygonal cells and presence of pseudopillars) lead us decide to sort these new species into a more convenient genus, *Lapeirousella.*

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PLATES

PLATE - I

Hatayia spinosus n.gen. n.sp.

Fig. 1 - Upper and lower valve, external view of the siphonal region, x 1, genoholotype.

Fig. 2 - Anterior view x 1, genoholotype.

Fig. 3 - Posterior view, x 1, genoholotype.

Fig. 4 - Upper view of the lower valve, x 1, genoholotype.

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PLATE - II

Hatayia spinosus n.gen. n.sp.

Fig. 1 - Cross-section of the lower valve, X 1, genoholotype.

Lapeirousella anatolica n.sp.

Fig. 2 - External view of the siphonal region, x 1, holotype.

Fig. 3 - Cross-section of the lower valve, X 1, holotype.

Fig. 4 - Cross-section of the siphonal region of the lower valve, x 3, holotype.

Lapeirousella yalazensis n.sp.

Fig. 5 - Cross-section of the siphonal region of the lower valve, x 2, holotype.

Fig. 6 - External view of the siphonal region, x 1, holotype.

Fig. 7 - Cross-section of the lower valve, X 1, holotype.

E,S - Anterior, posterior siphonal bands.

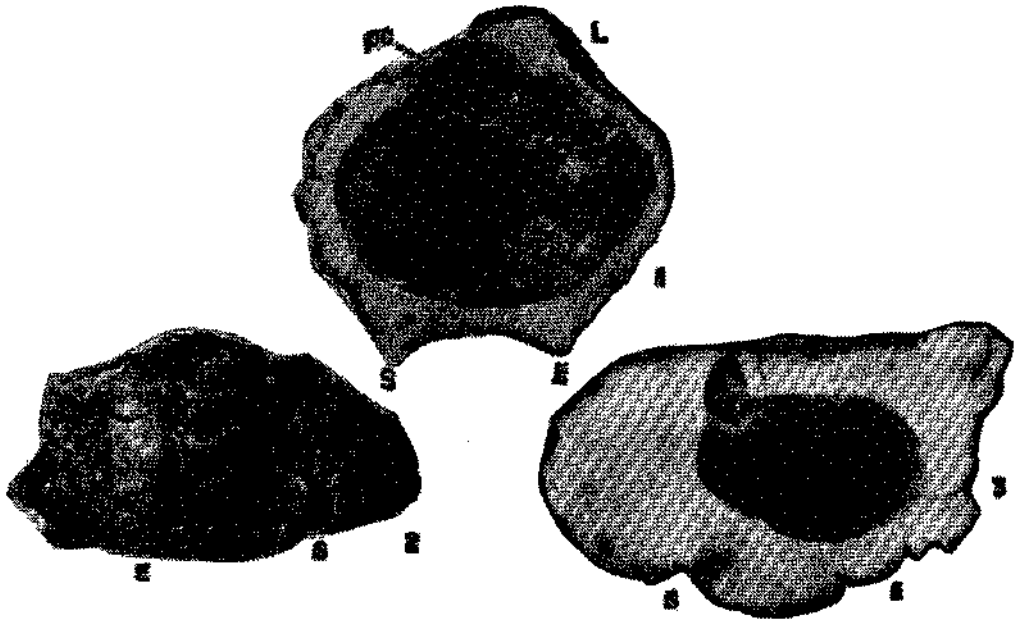
Epp, Spp - Anterior, posterior pseudopillars.

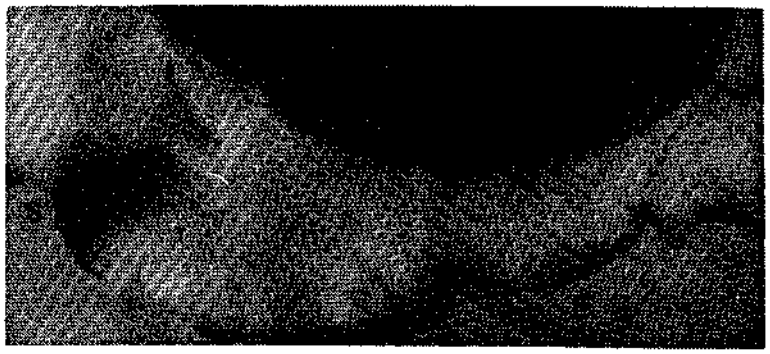
L - Ligamental ridge,

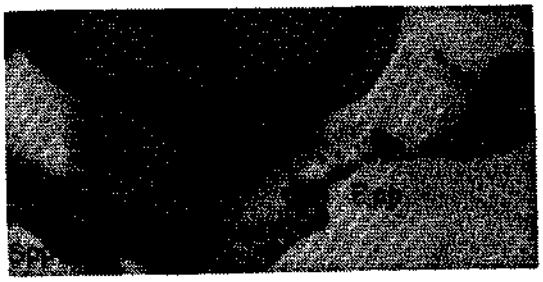
pc - Pseudocanals.

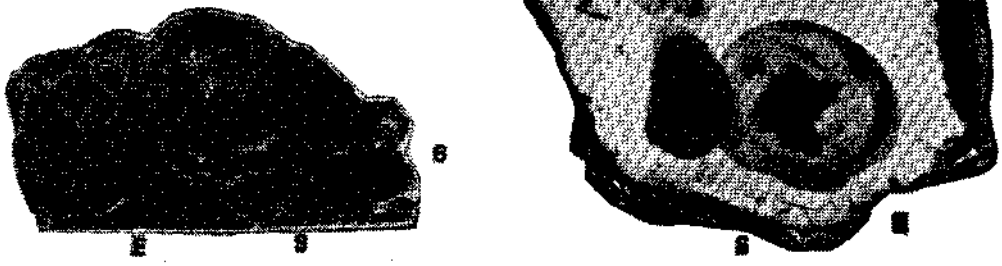
D - Body cavity.

11 - Lamellar layer.









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