THE RUDIST MATHESSIA TERTICOLLOQUIRUDISTARUM N. GEN., N. SP.
IN THE UPPER APTIAN OF SERRA SBREGAVITELLI, MATESE,
SOUTH APENNINES, ITALY

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ABSTRACT

A new genus and a new species of rudist (Mathecessia terticolloquiorudistarum) are described. The specimens were recovered in upper Aptian beds on the top of a limestone sequence in Serra Sbregavitielli, in northeaste Manese of the southern Apennines, Italy. The new taxon shares characteristics of caprinid and radiolitid rudists, because the shell wall of right valve presents two rows of small palial canals. The left valve is capuliform and the right valve conical. The ornamentation consists of acute-angle longitudinal ribs, alternating with obtuse-angle ribs; there are two siphonal bands separated by an interband with one rib. Internal ligamental ridge present, without external ligamental groove.

Key words: Rudistae, Caprinidae, Radiolitidae, upper Aptian, Matese, Italy, southern Apennines.

RESUMEN

Se describe un nuevo género y una nueva especie de rudista (Mathecessia terticolloquiorudistarum). Los especímenes fueron encontrados en capas del Aptaño superior en la parte alta de una secuencia de calizas en la Sierra Sbregavitielli en el noreste de Matese, al sur de los Apenninos, en Italia. El nuevo taxón comparte características de rudista caprinido y radiolítido, porque la pared de la concha de la valva derecha presenta dos hileras de canales paliales pequeños. La valva izquierda es capuliforme y la valva derecha es cónica. La ornamentación consiste en costillas longitudinales en ángulo agudo alternando con costillas en ángulo obtuso. Hay dos bandas sifónales separadas por una interbanda con una costilla. Existe una cresta interna del ligamento, pero no hay surco externo de ligamento.


INTRODUCTION

The Aptaño limestone sequence, about 200 m thick, of Serra Sbregavitielli in the southern Apennines of Italy (Map IGM 162, I130) (Figures 1, 2) is distinguished by a rich fauna of rudists, ostracids and nerineids (D’Argenio et al., 1988, 1989; Accordi and Carbona, 1990; Accordi et al., 1990; Masse et al., 1993). In the top of the Aptaño sequence, in the upper Aptaño beds, was discovered a reef mostly formed by a myriad of specimens of a small calcareous rudist that can not be assigned to any known genus and species.

The reef consists of a layer 0.5 to 2 m thick, whose length is not known because the outcrop is covered by vegetable soil. The specimens of the new taxon are predominantly in growth position and associated with rare requiniids, gastropods and pelecypods. The matrix is calcarenitic and rarely calcilutitic. The organogenic limestone bearing the new taxon is in part the same mentioned by Parona (1909) as pietra da amellini (little rings limestone), which at that time was considered as lower Cenomanian (Parona, op. cit.) but, according to recent research at d’Ocre Mountain in Abruzzo Aquilano of the central Apennines, Italy, it is considered Aptaño in age; however, the systematic study does not include specimens of d’Ocre Mountain.

SYSTEMATIC PALEONTOLOGY

The repository of the studied specimens is the Museum of Paleontology of the Dipartimento di Scienze della Terra, Università La Sapienza, Roma.

Order Rudistae Lamarck, 1812
Suborder Sinistrodonta Pchelintsev, 1959; Mainelli, 1992
Family Caprinidae d’Orbigny, 1850

Mathecessia n. gen.

Type species—Mathecessia terticolloquiorudistarum, by monotypy.

Diagnosis—Shell very inequivalve, attached valve conical, free valve capuliform. Shell wall of compact inner layer and outer layer ornamented with longitudinal angular ribs. Attached valve with a median layer of two rows of small round canals. In both valves, siphonal bands with one rib in the interband; ligamental ridge without ligamental external groove; body cavity without tabulæ.

Derivation of name—From Matese Massif, in the southern Apennines, Italy, Mathecessia in Latin.

Mathecessia terticolloquiorudistarum n. sp.
(Figures 3, 4; Plate 1, figures 1-13; Plate 2, figures 1-10; Plate 3, figures 1-4)

Diagnosis—Shell small, highly inequivalve and inequilateral; left valve capuliform, right valve conical with longitudinal
The right valve (attached valve) is conical-elongated, slightly arched toward the ventral region; cross section at the commissure circular to oval. The shell wall contains three layers (Figure 5). The inner is very thin and compact, giving rise to the internal structures. The median layer is formed by two rows of very small circular pallial canals. The external layer consists of numerous funnel-shaped lamellae, one on top of the other, with acute radial undulations on the edge. The undulating edge of these lamellae forms the longitudinal acute-angle ribs and obtuse-angle ribs. The siphonal bands are bound by two very obtuse-angle ribs; the interband presents one acute-angle, very salient, longitudinal rib (Plate 2, figures 1, 3). The band toward the posterior side (sb) is flat and wider than the band toward the ventral side (eb) which is concave and narrow. Ligamental ridge in an internal accessory cavity, without external groove. The cardinal-myophoral structure is of the type: am 1° 2.3° pm.

The cardinal apparatus is formed by a thickening as a platform in the dorsal region of the inner layer. The anterior (am) and posterior (pm) myophores are on the wall of the ventral cavity, separated by the cardinal platform. The median

Figure 2. Serra Sbregavitelli shows limestone sequence cropping out along the road.
tooth is conical (2) with one socket at each side, being the anterior shallow and conical and the posterior conical and deep.

The left valve (free valve) is slightly capuliform, with prosogyrous umbo a little above the commissure. Outline of the commissure suboval. The shell wall is formed of an inner, compact layer generating the cardinal-myophoral structures; the outer layer forms the thin ornamentation of funnel-shaped lamellae, with undulating edge. The undulations form intercalated acute-angle and obtuse-angle radial ribs. The two siphonial bands are separated by a narrow interband. There is not ligamental groove. The cardinal myophoral apparatus is of the type: am 1 2’ 3 pm.

The elements are together on a thick plate of the shell-wall inner layer, with well developed teeth, being the anterior tooth (1) smaller than the posterior (3). The median socket (2’) is large, deep and conical. On the cardinal platform there is a large dorsal accessory cavity for the ligamental ridge.

**Derivation of the name**—Dedicated to the Third Conference on Rudists (in Latin Tertii-colloquii-rudistarum), which was held in Mexico in November 1993.

**Type locality**—Serra Shregavitelli, northeastern Materese, southern Apennines, Italy.

**Type stratum**—Rudistid limestone in the open carbonate platform of northeastern Materese Massif.

**Age**—Late Aptian.

**Material**—Hundreds of specimens of which only one is a complete shell and three are complete attached valves; the others are transversal and longitudinal sections of both valves.

**Dimensions**—The holotype measures:
- Larger diameter at commissure: 11 mm
- Shorter diameter at commissure: 9 mm
- Height of right valve: 33 mm
- Height of left valve: 2 mm

**Discussion**—For the higher categories, the author adopted the systematic which is considered more natural (Lamarck, 1812; Pchelintsev, 1959; Mainelli, 1992). The minor categories and

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Plate 2. Maihesia terticolloquiu.rudistarum n. gen., n. sp. Age: late Aptian. Locality: Serra Shregavitelli in northeastern Materese, southern Apennines, Italy. Figure 1—AV = RV, transversal section, x 6. The view shows outer layer (ol), median layer (ml), inner layer (il); siphonial band in sb flat, more large than eb that is hollow, both separated in the sides by common ornamentation with very obtuse ribs; interband (ib) with one very obtuse rib. Figure 2—AV = RV, transversal section, x 6. The view shows: shell structure in outer (ol), median (ml), and inner layers (il). Partial position of anterior and posterior myophores. Figure 3—a, b - AV = RV, transversal sections, x 4.5. In a, it is evident the large accessory cavity (a) receiving ligamental ridge (lr). In b, are evident the siphonial bands sb (exhalant band), ib (interband), eb (inhalant band) limited by obtuse ribs. Figure 4—AV = RV, transversal section, x 3.8. The specimens, in growth position, show siphonial apparatus of each of them oriented in such a way as to ensure the siphonial functionality of the others; some obtuse ribs. In a, it is evident the accessory cavity receiving ligamental ridge, and the posterior and anterior sockets. Figure 5—AV = RV, transversal section, x 8. The view shows: cardinal apparatus in the elements 1’, 2, 3; position of anterior (am) and posterior (pm) myophores; large accessory cavity (a) receiving ligamental ridge (lr); ventral-cavity (vc). Figure 6—AV = RV, transversal section, x 4. The view shows, essentially, some obtuse ribs. Figure 7—AV = RV, transversal section of cardinal platform, x 8. The view shows layers il-mt-ml; median layer (ml) in two rows of rounded pallial canals; position of anterior (am) and posterior (pm) myophores. Figure 9—AV = RV, transversal section of dorsal region, x 9. The view shows position of anterior and posterior myophores: elements 1’, 2, 3’ of cardinal apparatus; large accessory cavity receiving ligamental ridge (lr); accessory cavities (ac). Figure 10—AV = RV, transversal sections, x 4.5. In a, two rows of rounded pallial canals. In all the sections is evident the variability in the shape.
most of the technical terms are used according to Dechaseaux and coworkers (1969).

The new taxon is characterized by the following features: two rows of small circular pallial canals in middle layer of right valve; a few accessory cavities in right valve; ornamentation of low, obtuse-angle longitudinal ribs, alternating with more salient, acute-angle ribs; siphonal bands with narrow interband.

The new genus Mathesia could be assigned to the family Caprinidae d’Orbigny (1850) on account of the presence of pallial canals and accessory cavities, but it more precisely belongs to the “informal group number 3” of Dechaseaux (1969) which comprises those caprinids with some radiolitid features. The new taxon presents the following characteristics of Radiolitidae: right valve bigger and conical, left valve small, almost opercular; ornamentation of longitudinal ribs resulting from radial funnel-shaped lamellae; siphonal bands flat and concave with an interband; teeth fused with myophores on a platform of right valve.

The mentioned features are compared with those present in some genera of the family Caprinidae d’Orbigny or subfamily Radiolitinae Gray, particularly with Ichthyosarcocilites Desmarest and Agriopleura Kuhn (1932) (Masse and Philip, 1974), which resemble in some aspects to the new taxon (Table 1). Mathesia terticolloquirudistaran is also compared with Agriopleura darderi Astre (1933, 1957), because they are similar in a few characteristics (Table 2). However, through this comparison, it is evident that these two taxa are no conspecific and hardly could they belong to a possible new genus, as it was pointed out by Jean Pierre Masse (oral and written communication) of the University of Provence at Marseille.

A notable phenotypic variability is shown in the cross and longitudinal sections of the valves (Plate 2, figures 3, 4; Plate 3, figures 3, 4) although this fluctuation can be due, in part, to the distinctly oriented natural sections in the rocks, cutting the axis of the valves at different angles, which can be normal, parallel, or tangential, and at different levels.

ABBREVIATIONS

RV = right valve (= FV, free valve)
LV = left valve (= AV, attached valve)
pr = posterior region
ar = anterior region
c = carine
1 = anterior tooth
1’ = anterior socket
2 = median tooth

Plate 3. Mathesia terticolloquirudistaran n. gen., n. sp. Age: late Aptian. Locality: Serra Shregavelli in northeastern Mateses, southern Apennines, Italy. Figure 1—a, b. Longitudinal sections of AV = RV, x 5. The views show ventral-cavity lacking tabulae; ornamental outer layer, ol, formed by radial funnel-shaped lamellae. In b, the cellulo-prismatic structure of a portion of ornamentation is evident. Figure 1, b’—Portion of ornamentation in 1, b, enlarged, that shows the cellulo-prismatic structure among the lamellae. Figure 2—AV = RV, x 5. The inferior portion in longitudinal section shows the ventral-cavity, vc, and the thickness of the shell. The higher portion, on the right, shows the ornamentation with obtuse ribs. Figure 3—Two oblique sections of RV that show the pallial rounded canals, x 6. Figure 4, a, b. In a, oblique section of RV, x 5 that shows ornamentation of the outer layer, ol, in a funnel-shaped undulating lamella with obtuse ribs on the edge; median layer, ml, area of the pallial canals; inner layer, il. In b, longitudinal section of RV, x 5, that shows compact, thin inner layer, il; canaliculate median layer, ml; ornamental outer layer, ol; elements 3’, posterior socket, 2, median tooth of the cardinal apparatus; ventral-cavity, vc, lacking of tabulae.
Figure 5. a, b, c. Structures in diagram. In a, b, c. Shell layers: il = thin, compact, inner layer; ml= pallial canals in two rows (canalicate layer = median layer); ol = ornamental funnel-shaped lamellae (outer layer). In a, b, longitudinal sections. Cardinal-myophoral apparatus: 1 = anterior tooth, 1' = anterior socket, 2 = median tooth, 2' = median socket, 3 = posterior tooth, 3' = posterior socket, pm = posterior myophore, am = anterior myophore, lr = ligamental ridge. Ligamental groove lacking. Other symbology: FV = free valve, LV = left valve, AV = attached valve, RV = right valve, mcp = myophoral-cardinal apparatus, cp = cardinal apparatus, vc = ventral cavity.

Table 1. Distinction among compared genera.

<table>
<thead>
<tr>
<th>Characters considered</th>
<th>Mathesia n.g.</th>
<th>Agriopleura Kuhn</th>
<th>Ichthyosarcocites Desmarest</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached valve=right valve (AV=RV)</td>
<td>Conical, conical elongate</td>
<td>Conical, conical elongate</td>
<td>Curved or loosely coiled, carinated</td>
</tr>
<tr>
<td>Shell structure in median layer</td>
<td>Canalicate</td>
<td>Canalicate</td>
<td></td>
</tr>
<tr>
<td>Accessory cavities</td>
<td>One or few</td>
<td>One</td>
<td></td>
</tr>
<tr>
<td>Ornamentation</td>
<td>Longitudinally ribbed or with few very obtuse ribs intercalated</td>
<td>Longitudinally ribbed</td>
<td>Longitudinally very minutely ribbed</td>
</tr>
<tr>
<td>Siphonal bands</td>
<td>Flat sb hollow eb or both lightly hollow</td>
<td>Smooth, in furrows</td>
<td></td>
</tr>
<tr>
<td>Cardinal apparatus</td>
<td>On platform separated by vc with septum</td>
<td>On platform separated by vc with septum</td>
<td>On thin thickness of dorsal ventral cavity wall</td>
</tr>
<tr>
<td>Myophoral apparatus</td>
<td>Pm am on thicknesses of ventral-cavity wall</td>
<td>Pm am on thicknesses of ventral-cavity wall</td>
<td>Pm am on thicknesses of ventral cavity wall</td>
</tr>
<tr>
<td>Ligamental apparatus</td>
<td>Ligamental ridge in one large accessory cavity; no ligamental groove</td>
<td>Ligamental ridge in one large accessory cavity; ligamental groove</td>
<td></td>
</tr>
<tr>
<td>Ventral-cavity tabulae</td>
<td>Absent</td>
<td>Absent</td>
<td>Present</td>
</tr>
<tr>
<td>Free valve=left valve (FV=LV)</td>
<td>Capuliform or operculiform</td>
<td>Operculiform or lightly concave</td>
<td>Curved, carinated</td>
</tr>
<tr>
<td>Accessory cavity</td>
<td>One</td>
<td>One</td>
<td></td>
</tr>
<tr>
<td>Ornamentation</td>
<td>Longitudinally minutely ribbed or with few obtuse ribs intercalated</td>
<td>Longitudinally minutely ribbed</td>
<td>Longitudinally very minutely ribbed</td>
</tr>
<tr>
<td>Siphonal bands</td>
<td>Flat sb hollow eb or both lightly hollow</td>
<td>In furrows</td>
<td></td>
</tr>
<tr>
<td>Cardinal-myophoral apparatus</td>
<td>Elements fused on platform or with myophores on light apophyses</td>
<td>Elements fused on platform or with myophores on light apophyses</td>
<td>Elements fused on platform</td>
</tr>
<tr>
<td>Ligamental apparatus</td>
<td>Ligamental ridge in one large accessory cavity; no ligamental groove</td>
<td>Ligamental ridge in one large accessory cavity; no ligamental groove</td>
<td></td>
</tr>
<tr>
<td>Ventral-cavity tabulae</td>
<td>Absent</td>
<td>Absent</td>
<td>Present</td>
</tr>
</tbody>
</table>
Table 2. Distinction among the compared species deduced from specimens discovered in La Costa mountain. in northeastern Matese Massif.

<table>
<thead>
<tr>
<th>Characters considered</th>
<th>Mathesia terticholloguiridistarum n. sp.</th>
<th>Agriopleura dardei Astre</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attached valve = right valve (AV = RV)</td>
<td>Conical, elongate</td>
<td>Conical, elongate</td>
</tr>
<tr>
<td>Pallial canals in transversal section</td>
<td>Small, rounded in two rows</td>
<td>Lanceolated, arrow shaped, ovoidal in one row, formed by invagination of median layer</td>
</tr>
<tr>
<td>Accessory cavities</td>
<td>Three small on posterior cardinal platform, one large dorsally receiving ligamental ridge</td>
<td>One large dorsally receiving ligamental ridge</td>
</tr>
<tr>
<td>Ornamentation</td>
<td>Longitudinally ribbed with very obtuse ribs intercalated</td>
<td>Longitudinally ribbed</td>
</tr>
<tr>
<td>Siphonal apparatus</td>
<td>Flat sb, hollow eb</td>
<td>Sb eb lightly hollows</td>
</tr>
<tr>
<td>Cardinal apparatus</td>
<td>Conical median tooth between two sockets on platform separated by vc with septum</td>
<td>Conical median tooth between two sockets on platform separated by vc with septum</td>
</tr>
<tr>
<td>Myophoral apparatus</td>
<td>On thick areas of ventral cavity wall</td>
<td>On thick areas of ventral cavity wall</td>
</tr>
<tr>
<td>Ligament</td>
<td>Ligamental ridge in one large accessory cavity; no ligamental groove</td>
<td>Ligamental ridge in one large accessory cavity; ligamental groove</td>
</tr>
<tr>
<td>Free valve = left valve (FV = LV)</td>
<td>Capuliform</td>
<td>Operculiform</td>
</tr>
<tr>
<td>Accessory cavity</td>
<td>One large dorsally receiving ligamental ridge</td>
<td>One large dorsally receiving ligamental ridge</td>
</tr>
<tr>
<td>Ornamentation</td>
<td>Longitudinally minutely ribbed with few obtuse ribs intercalated</td>
<td>Longitudinally minutely ribbed</td>
</tr>
<tr>
<td>Siphonal bands</td>
<td>Flat sb, hollow eb</td>
<td>Eb sb lightly hollow</td>
</tr>
<tr>
<td>Cardinal apparatus</td>
<td>Elements fused on platform; 1-3 well-developed, 2' deep, conical; pm am on platform</td>
<td>Elements fused on platform; 1-3 highly equally developed, 2' deep, oblique; pm am on external face of light apophyses</td>
</tr>
<tr>
<td>Ligament</td>
<td>Ligamental ridge in dorsal large accessory cavity; no ligamental groove</td>
<td>Ligamental ridge in one large accessory cavity; ligamental groove</td>
</tr>
</tbody>
</table>

2' = median socket
3' = posterior tooth
3' = posterior socket
am= anterior myophore
pm= posterior myophore
cm = commissural plane

BIBLIOGRAPHICAL REFERENCES


Accordi, Giovanni, Carbone, Federico; Cestari, Riccardo; Reali, Sandro; and Sirna, Giuseppe, 1990, Cretaceous rudist colonization in northeastern Matese, in Accordi, Giovanni; Carbone, Federico; and Sirna, Giuseppe, eds., Rudist communities and substratum in the Matese Mounts, Molise, Italy: Università "La Sapienza", Centro di Studio per la Geologia dell’Italia Centrale, Consiglio Nazionale delle Ricerche, and Dipartimento di Scienze della Terra, International Conference on Rudists, 2, Rome, Bari, Field trip, p. 19-43, 7 fig.


Masse, J.P.: Gallo-Maresca, Magda; and Luperto-Sinni, E., 1993, Aptian rudists from Lago di Matese (central Italy) and their stratigraphic and paleoenvironmental framework: Universidad Nacional Autónoma de México, Instituto de Geología, Third International Conference on Rudists, Mexico, D.F., Abstracts, p. 42 (abstract).


Pechentsev, V.F., 1959, Rudisty Mezozoya gornogo Kryma (Mesozoic Rudists
of the Crimean Range: Geologicheskii Musei A.P. Karpinskii, Akademii
Nauk, SSR, Seriya Geologicheskaya, 178 p., 43 pl.
d'Italia alla scala 1:100,000.

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