

## Remarks on the genus *Angelismilia* Reig, 1988 (Scleractinia, Early Cretaceous)

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### Resumen

LÖSER, H. Puntualizaciones sobre el género *Angelismilia* Reig, 1988 (Scleractinia, Cretácico temprano). Se revisa el género *Angelismilia* Reig, 1988, un coral del Albiense temprano, en base a un sintipo y a material adicional procedente del área de los tipos. *Angelismilia*, anteriormente considerado un coral con septos perforados y establecido sin una posición sistemática, tiene septos compactos y pali, siendo asignado a la familia Caryophylliidae.

Palabras clave: Scleractinia, Cretácico, España.

### Abstract

The Early Albian coral genus *Angelismilia* Reig, 1988 is revised using a syntype of the type species as well as topotypical material from the type area. *Angelismilia*, formerly considered a coral with perforated septa that was created without indicating its systematic position, has compact septa and pali. For this reason it is placed in the family Caryophylliidae.

Key words: Scleractinia, Cretaceous, Spain.

### INTRODUCTION

The solitary coral genus *Angelismilia* was established by Reig (1988) based on *Trochosmilia portisi* Angelis d'Ossat, 1905. Reig did not include type material in his study, which is, in this case, of a low importance because the genus is easily recognisable and was probably relatively common in the type area around Castellví de la Marca (SW of Barcelona, NE Spain). Finds are still possible, even if the fields around the former grange Can Pascol (also known in literature as Can Pascual), where the fossils could be found, were abandoned roughly 50 years ago. Reig based his examination on the rich topotypical material of the Museo Geológico del Seminario de Barcelona. He presented only drawings and photographs of complete specimens, which left some doubt about the morphology of this type of coral. Moreover, Reig was not able to fix a systematic position for the new genus.

Coral colonies offer the advantage that the same morphological pattern is repeated in the individuals of the colony, which allows for greater understanding of the ontogeny and morphological variation. A solitary coral does not allow this type of observation. After the preparation of two or three thin sections, the specimen is practically lost. The study of solitary corals always requires numerous specimens that allow thin sections in various ontogenetic stages, including different orientations, to be observed. To decipher the genus *Angelismilia* and to fix its taxonomic position, a considerable amount of material was observed, and much was lost as well.

### MATERIAL

The observed specimens come from outcrops around the small town of Castellví de la Marca (Mun. Castellví de la Marca, Com. Alt Penedès, Barcelona province, Catalonia, Spain); for instance, from the area around the grange Cal Morgades, the already mentioned area around Can Pascol, and from the same stratigraphic level close to the village of Masarbonès (Mun. Masllorenç, Com. Baix Penedès, Tarragona province, Catalonia, Spain). The outcropping sediments belong to the Montmell Fm., and are currently assigned to the basal Albian (Tardefurcata Zone). The solitary corals of the genus *Angelismilia* do not occur together with colonial corals that are found at a slightly higher stratigraphic level. In outcrops and/or levels with a rich fauna of colonial corals, such as Masarbonès or Can Xuec (Mun. Marmellar), *Angelismilia* was not found.

### SYSTEMATIC DESCRIPTION

Abbreviations. Collection abbreviations are as follows: BSPG, Bayerische Staatssammlungen für Paläontologie und Geologie, München, Germany; MGB, Museu de Geologia de Barcelona-Museu de Ciències Naturals de Barcelona, Spain; MGSB, Museo Geológico del Seminario de Barcelona, Spain; MPUR, Museo di Paleontologia, Università La Sapienza, Roma, Italy. The observed material is shown in Table 1.

Order SCLERACTINIA Bourne, 1905  
Suborder CARYOPHYLLIINA Vaughan & Wells, 1943  
Family CARYOPHYLLIIDAE Dana, 1846  
***Angelismilia* Reig, 1988**

Fig. 1-2

*Type species.* *Trochosmilia portisi* Angelis d'Ossat, 1905 by original designation.

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*Types.* Four syntypes (MGB 30542, MPUR i. 421, i. 422, i. 423). There exists no holotype, as claimed by Reig (1988). The correct number of the so-called holotype is not “4110” but “i. 421”. A lectotype was, hitherto, not designated.

*Description.* Solitary turbinate coral. Calicular outline elliptical, larger diameter measures ca. 133% of the smaller diameter, calicular pit not depressed. Septa compact. Microstructure of small-sized trabeculae, septa with a median dark line. Septa in cross section are thick close

to the wall and thinner towards the centre. Septal maximum thickness 350  $\mu\text{m}$ . Symmetry of septa radial and regularly hexameral. Cycles of septa sub-regular. Five to six cycles ( $s=96-192$ ). Septal cycles differ in length and thickness. The first three septal cycles extend to the centre of the calyx: later cycles are shorter. Septa occasionally connect to each other. Septal upper margin smooth, lateral face with fine thorns, inner margin slightly swollen in places. Pali present, at least on four septal cycles in up to three crowns. Most septa of the first two cycles are connected to the columella. Costae are hardly present, with

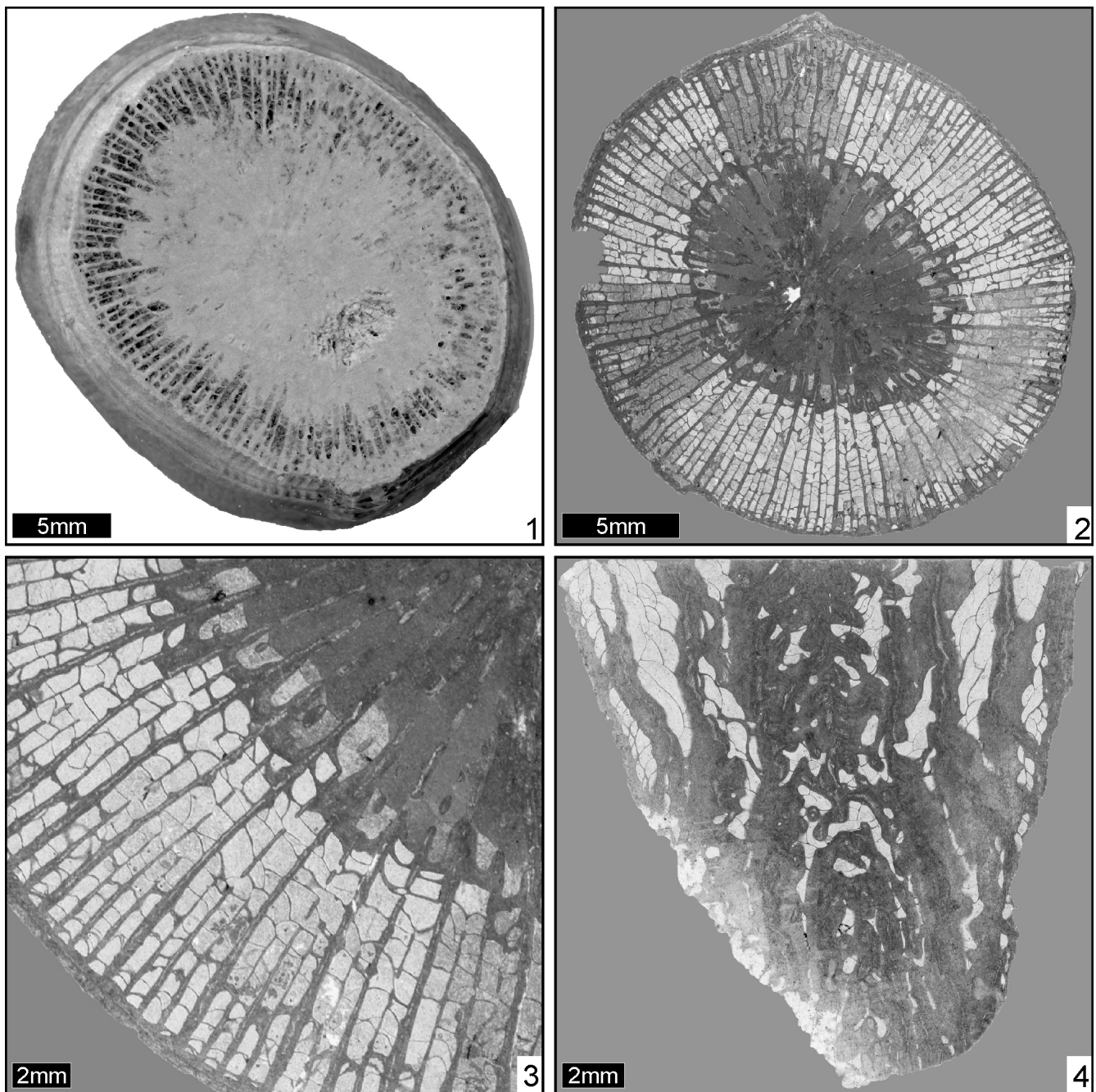


Fig. 1. *Angelismilia portisi* (Angelis d'Ossat, 1905): 1) syntype MGB 30542-2, polished section ; 2-4) BSPG 2003 XX 7249; 2-3, transversal thin sections; 4, longitudinal thin section.

Fig. 1. *Angelismilia portisi* (Angelis d'Ossat, 1905): 1) sintipo MGB 30542-2, sección pulida; 2-4) BSPG 2003 XX 7249; 2-3, láminas delgadas transversales; 4, lámina delgada longitudinal.

fine granulae on their surface. Synapticulae absent. Columella composed of various lamellae. Endotheca consists of numerous small dissepiments. Exotheca present. Wall present: compact, septothecal. Epitheca present.

*Remarks.* Reig (1988) described the coral as having septal perforations. Septal perforations occur only in coral families where the trabeculae are large or medium-sized. Synapticulae may be present also in families where the

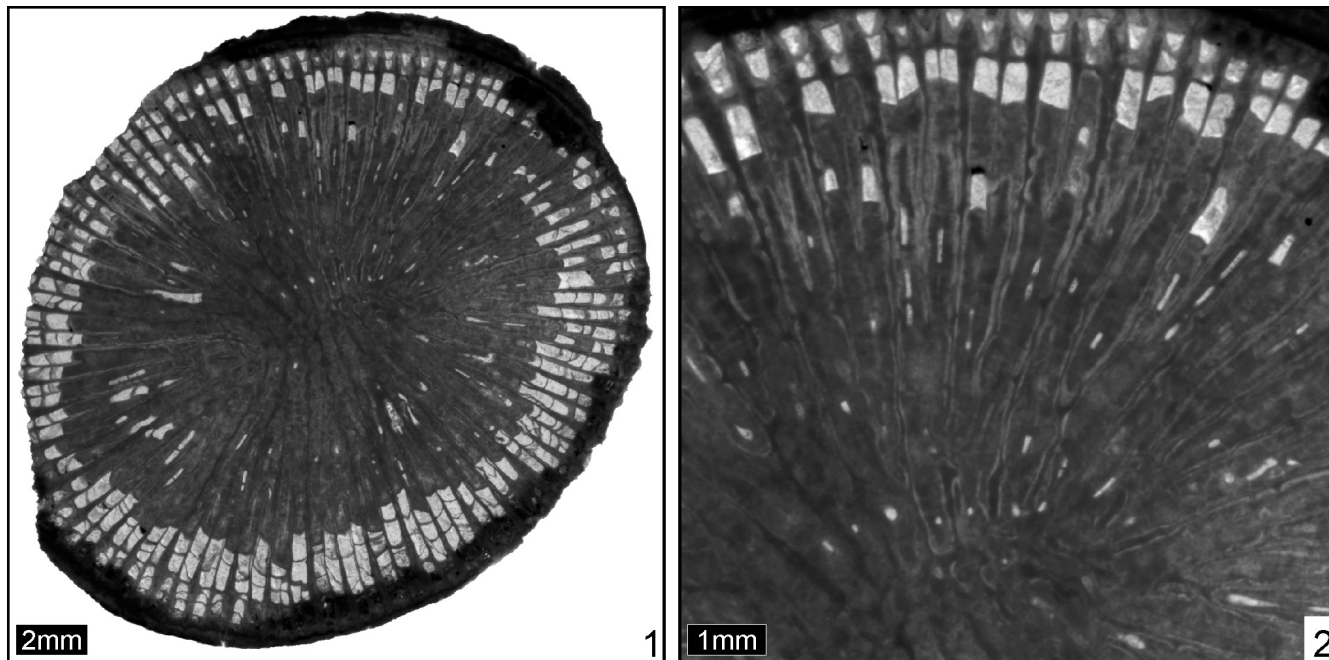


Fig. 2. *Angelismilia portisi* (Angelis d'Ossat, 1905): 1-2) BSPG 2003 XX 6817, transversal thin section of a deeper level to show the compact septa.  
Fig. 2. *Angelismilia portisi* (Angelis d'Ossat, 1905): 1-2) BSPG 2003 XX 6817, lámina delgada transversal a nivel más profundo para evidenciar los septos compactos.

| <i>Specimen</i>   | <i>Locality</i>            | <i>Type status</i>                                  |
|-------------------|----------------------------|---|
| BSPG 2003 XX 1825 | Masarbonès                 |   |
| BSPG 2003 XX 6817 | Cal Morgades               |   |
| BSPG 2003 XX 6830 | Can Pascol                 |   |
| BSPG 2003 XX 6832 | Can Pascol                 |   |
| BSPG 2003 XX 7247 | Masarbonès                 |   |
| BSPG 2003 XX 7248 | Masarbonès                 |   |
| BSPG 2003 XX 7249 | Masarbonès                 |   |
| MGB 20309#1       | Mun. Castellví de la Marca | ST of <i>Trochosmilia neviani</i>                   |
| MGB 20309#2       | Mun. Castellví de la Marca | ST of <i>Trochosmilia neviani</i> pl. 15, fig. 3b   |
| MGB 30542         | Can Pascol                 | ST of <i>Trochosmilia portisi</i> pl. 15, fig. 2c   |
| MGB 30543         | Mun. Castellví de la Marca | ST of <i>Trochosmilia neviani</i> pl. 15, fig. 3a   |
| MGSB 49432        | Can Pascol                 | HT of <i>Angelismilia angelisi</i>                  |
| MGSB 81317        | Can Pascol                 |   |
| MGSB 81318        | Can Pascol                 |   |
| MGSB 81319        | Can Pascol                 |   |
| MPUR i. 421       | Can Pascol                 | ST of <i>Trochosmilia portisi</i> pl. 15, fig. 2a   |
| MPUR i. 422       | Can Pascol                 | ST of <i>Trochosmilia portisi</i> pl. 15, fig. 2d   |
| MPUR i. 423       | Can Pascol                 | ST of <i>Trochosmilia portisi</i> pl. 15, fig. 2f   |
| MPUR i. 425       | Can Pascol                 | ST of <i>Trochosmilia neviani</i> pl. 15, fig. 3d   |
| MPUR i. 427       | Can Pascol                 | ST of <i>Trochosmilia sandalina</i> pl. 15, fig. 4d |

Table 1. Specimen number, locality, type status, and the figure number in Angelis d'Ossat (1905) of observed material. ST, syntype; HT, holotype.  
Tabla 1. Número de ejemplar, localidad, estatuto de tipo, y número de figura en Angelis d'Ossat (1905) del material revisado. ST, sintipo; HT, holotipo.

trabeculae are small or invisible (Acroporidae, Dendrophylliidae, holocoeniids). *Angelismilia* has very small trabeculae; for that reason, it would be a rare exception to this rule. Sections in different levels of the solitary coral showed that the septa are compact, and the “perforations” are, on one hand, the space between the septa inner margin and the pali, and, on the other, probably the result of erosion. The inner wall discussed by Reig (1988) is an incorrect interpretation. A septothecal wall exists, as do –rather uncommon– external dissepiments that are covered by a thin epitheca.

**Systematic position.** *Angelismilia* is a typical caryophylliid coral and differs only by the well-developed endotheca and exotheca from the diagnosis of the family. Members of the suborder with an endotheca are traditionally assigned to the family Parasmiliidae, but also, in this family, the endotheca can be absent or well developed in the same species (e.g., so-called *Parasmilia*). The family Caryophylliidae is here preferred because it is better defined. The type of the type species of *Parasmilia*, *Madrepora mantelli* (Milne-Edwards & Haime, 1850) has never been examined in detail, and topotypical material is unknown.

**Species.** Five [nominal] species must be considered: *Angelismilia angelisi* Reig, 1991, *Angelismilia magnei* Reig, 1995, *Trochosmilia nevirani* Angelis d'Ossat, 1905,

*Trochosmilia portisi* Angelis d'Ossat, 1905 and *Trochosmilia sandalina* Angelis d'Ossat, 1905.

The species discovered by Angelis d'Ossat (1905) were considered to be different ontogenetic stages of the same species by Reig (1988); this may or may not be possible. There are two problems with this hypothesis. First, Reig did not study the type material of the three species, and second, in the statistical analysis that he presented, septal counts are not included. The type material (see Manni, 2007) is only partially sectioned, and details –with the exception of those from *Trochosmilia portisi*– are unknown.

*Angelismilia angelisi* Reig, 1991 type is a small unsectioned specimen that does not allow a proper diagnosis. If it belongs to *Angelismilia*, it would substantially differ from the other species by a much higher number of septa. The type of *Angelismilia magnei* Reig, 1995 is lost. Its illustration may suggest that it belongs to *Angelismilia*, but it represents the same dimensions and septal counts as the former species.

When, in solitary corals, the amount of septa increases with the size of the individual, the septal number seems to be an ontogenetic characteristic and does not serve to distinguish between species. Observations made here in sectioned material show that the increase of septa correlates with a slight increase in the diameter (Fig. 3). Following Reig (1988), the three species established by Angelis d'Ossat (1905) are considered synonyms, giving priority to the type species.

The type material of the two species (*T. nevirani* and *T. portisi*) created by Angelis d'Ossat (1905) –and now assigned to *Angelismilia*– are distributed among the Museu de Geologia de Barcelona-MCNB (Spain) and the Museo di Paleontologia in Rome (Italy). All them are syntypes; no holotypes nor lectotypes of these two species exist, as incorrectly reported by Reig (1988). Thus far, only *T. sandalina* is represented by a so-called syntype; however, Reig mentioned a type from the MGB that may represent another syntype. Lectotypes are not selected here. See Table 1 for details.

**Range.** Early Albian (Tardefurcata zone).

**Distribution.** Verified occurrence of the genus is restricted to the Montmell Fm. in Catalonia (Spain). Other indications of the *Angelismilia* species (Alloiteau 1946/47, Bataller 1937b, 1947, Markovic 1951) are questionable.

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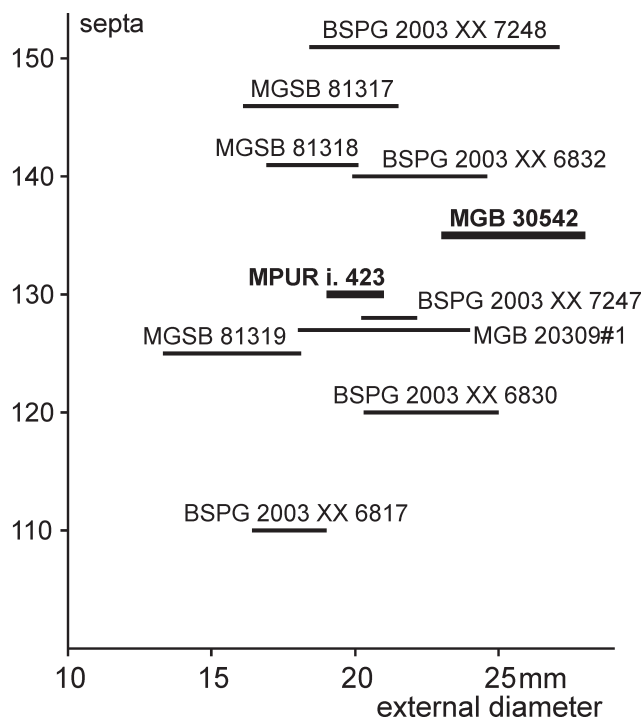


Fig. 3. Relation between the (smaller and larger) calicular diameter and the number of septa in selected specimens of *Angelismilia portisi*. Bars of type specimens are thicker.

Fig. 3. Relación entre el diámetro calicular (menor y mayor) y el número de septos en ejemplares seleccionados de *Angelismilia portisi*. Barras de los ejemplares tipo más gruesas.

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