

The genus *Brachyseris* Alloiteau 1946/47 and remarks on *Latimaeandraraea felixi* Angelis d'Ossat, 1905 (Scleractinia; Cretaceous)

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Resumen

LÖSER, H. El género *Brachyseris* Alloiteau 1946/47 y puntualizaciones sobre *Latimaeandraraea felixi* Angelis d'Ossat, 1905 (Scleractinia; Cretácico). Se estudia el coral *Latimaeandraraea felixi* del Albiense temprano mediante láminas delgadas obtenidas a partir de su holotipo. Ello ha permitido precisar la estructura de detalle del esqueleto y su posición sistemática, aunque su asignación genérica es cuestionable. La especie se relaciona con el género *Brachyseris* aunque se distingue por la ausencia del patrón típico (la formación de murallas toliiformes en dos niveles distintos) del género. Se revisa el género *Brachyseris* en base al holotipo y a material topotípico de la especie-tipo. El género está relacionado con otros géneros de la familia Leptophylliidae como *Microphyllia*, *Thalamocaeniopsis*, *Trigerastraea* y *Vallimeandra* y, muy probablemente, está limitado al Cretácico tardío.

Palabras clave: Scleractinia, Cretácico, España.

Abstract

The Early Albian coral species *Latimaeandraraea felixi* is investigated on the basis of thin sections obtained from the holotype. Its fine skeletal structure and systematic position are elucidated, but its generic position remains questionable. It is most closely related to the genus *Brachyseris* from which it differs by lacking the typical pattern (forming tholiform walls in two different levels) of this genus. The genus *Brachyseris* is considered in greater detail on the basis of the holotype and topotypical material of the type species. It is related to other Leptophyllid genera such as *Microphyllia*, *Thalamocaeniopsis*, *Trigerastraea* and *Vallimeandra*, but is very probably restricted to the Late Cretaceous.

Key words: Scleractinia, Cretaceous, Spain.

INTRODUCTION

Latimaeandraraea felixi was established by d'Angelis d'Ossat (1905). The genus *Latimaeandraraea* is a junior objective synonym of *Meandraraea* Etallon, 1859. *Meandraraea* is considered a meandrinoid microsolenid coral. The type of its type species, *Meandraraea marcouana* Etallon, 1859 was for a long time considered lost. Parts of the Etallon collection are kept in Porrentruy (Switzerland), and parts were recently found in the Muséum national d'Histoire Naturelle (Paris, France), including syntypes of *Meandraraea marcouana*.

Alloiteau (1946/47) included *Latimaeandraraea felixi* in the genus *Brachyseris* Alloiteau, 1946/47. He designated as type species of *Brachyseris* the poorly documented Late Cretaceous *Latomeandra morchella* Reuss, 1854, even though the text is ambiguous.

Brachyseris became almost unused; the type species was later assigned to *Meandraraea*, *Isastrea*, and *Thamnoseris*, among others (see Löser *et al.*, 2002), probably because the internal structure of the type species remained unknown. Beauvais (1982) revised the type of the type species of *Brachyseris*, confirmed the genus and assigned various species to it. He was mostly not followed by later authors.

The present study has two aspects. First, the genus *Brachyseris* is investigated in more detail. Second, the fine skeletal structure of *Latimaeandraraea felixi* is documented. Thin sections that were recently prepared from the holotype give a better diagnosis and alter the systematic position of the species.

SYSTEMATIC DESCRIPTION

Abbreviations. Collection abbreviations are as follows: MGB, Museu de Geologia de Barcelona-Museu de Ciències Naturals de Barcelona, Spain; MHE, Collection M. Heinrich, Eckental, Germany; NHMW, Naturhistorisches Museum Wien, Austria. The following abbreviations are used to indicate the dimensions of the corals: min., smallest measured value; max., largest measured value; μ , arithmetic mean of all measured values; σ , standard deviation of all measured values; cv, coefficient of variation according to K. Pearson; n, number of measurements. The abbreviations used in the synonymy lists follow Matthews (1973): *, earliest valid publication of the species name; non, the described material does not belong to the species concerned; v, the specimen was observed by the author. Quotations provided with neither a description nor an illustration are not cited here.

Order SCLERACTINIA Bourne, 1900
Suborder MICROSOLENINA Morycowa & Roniewicz, 1995
Family LEPTOPHYLLIIDAE Vaughan, 1905

Brachyseris Alloiteau, 1946/47

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Type species. Latomeandra morchella Reuss, 1854, by original designation.

Diagnosis. Meandroid colony. Calicular outline polygonal and elongated, centres slightly depressed. Calicular rows very short (1-3 calices), straight or curved. Calices distinct. Calicular rows narrow in the type species (ca. 3-4 mm). Septa perforated at their inner margin. Microstructure of large trabeculae. Septa in cross section thick close to the wall, thinner towards the centre.

Septal maximum thickness 300 μm (in the type species). Symmetry of septa irregular. No regular septal cycles or generations. Number of septa ca. 40 (in the type species). All septa reach 40% of the larger calicular diameter. Septa rarely connected to each other. Septal distal margin coarsely granulated, lateral face with penulae and thorns, inner margin smooth. Pali or paliform lobes absent. Costae present, confluent. Synapticulae occasionally present, mainly in the space between calices. Columella difficult to separate from the perforate septal

inner margins, probably consists of isolated trabeculae. Endotheca consists of thin tabulae. Wall present, not compact, synapticulothecal. Coenosteum absent. Budding intracalicular, polystomodeal and complete.

Relationships. *Brachyseris* is closely related to *Latiastrea* Beauvais, 1964, *Microphyllia* d'Orbigny, 1849, *Rhipidastraea* Eliášová, 1991, *Thalamocaeniopsis* Alloiteau, 1954, "Thamnoseris" de Fromentel, 1861, *Trigerastraea* Alloiteau, 1952, and *Vallimeandra* Alloiteau, 1957. Type material is available for all type species of the genera, except for *Thamnoseris*, which is a conceptual genus (Table 1). The most striking characteristic in *Brachyseris* is the irregularity of the calicular rows. The collines that mark the wall between the calices are tholiform and exist in two levels; higher and more pronounced separating the short calicular rows, lower and less pronounced separating the calices within the rows. The rows or groups of calices are not well defined and this makes comparison of samples (species) difficult. *Lophomeandra* Beauvais, 1982 is very probably a

Quantity of calices per row	Wall	Collines	Genus
Monocentric (cerioid)	present, double only present between adult calices present, but incomplete present, complete		<i>Ambiguastraea</i> <i>Mixastraea</i> <i>Thalamocaeniopsis</i> <i>Trigerastraea</i>
2-3 calices	present, but incomplete	tholiform, in two levels absent	<i>Brachyseris</i> "Brachyseris" <i>felixi</i>
3-4 calices	present, complete		<i>Latiastrea</i> <i>Rhipidastraea</i>
numerous	present, complete present, but incomplete		<i>Microphyllia</i> <i>Vallimeandra</i>

Table 1. Comparison of cerioid and meandrinoid coral genera of the family Leptophylliidae.

Tabla 1. Comparación entre géneros de corales cerioides y meandrinoides de la familia Leptophylliidae.

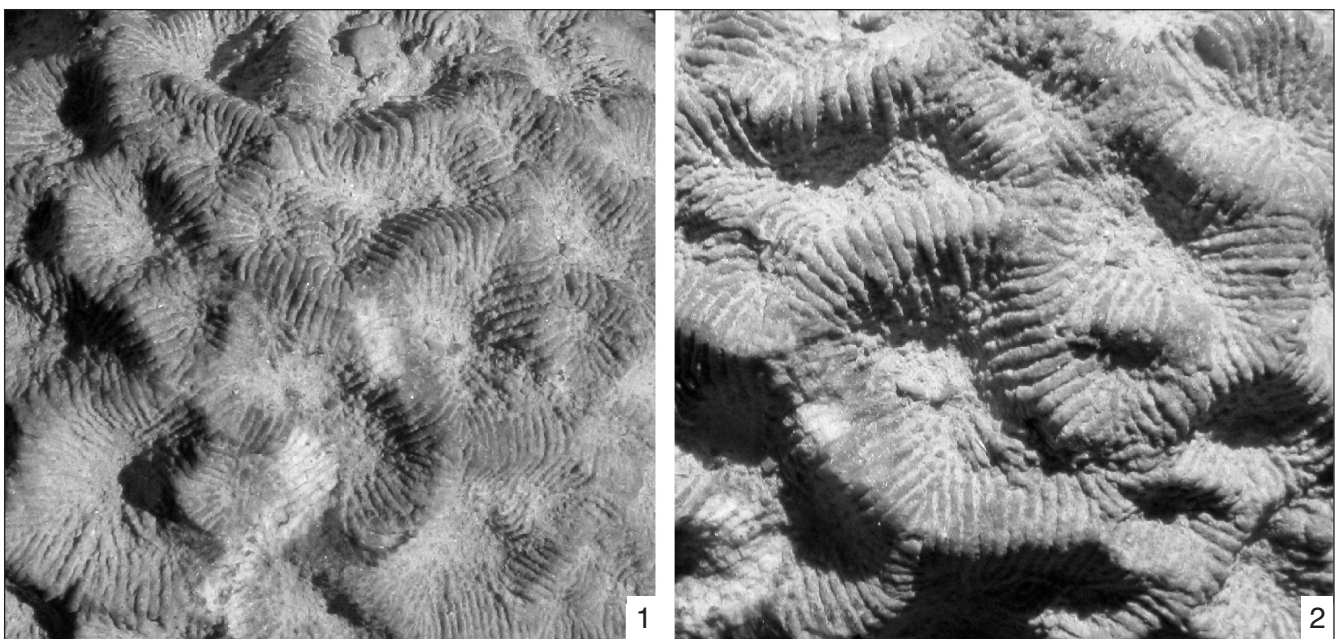


Fig. 1. *Brachyseris morchella* (Reuss, 1854). Holotype NHMW 1864/0040/1321: 1-2, colony surface.

Fig. 1. *Brachyseris morchella* (Reuss, 1854). Holotipo NHMW 1864/0040/1321: 1-2, superficie de la colonia.

junior synonym of *Brachyseris*. The difference of the two genera (Beauvais, 1982; volume 2, table 11) is very small.

Species separation. The following morphometric data can be obtained from *Brachyseris* samples: the distance of calicular rows, the width of the calicular rows, and the distance of the calices within the rows. The distance of the calices of the rows shows a very high variation, whereas the other two values show a lower variation. The distance of the calicular rows is better defined than its width. The number of septa is relatively constant within a colony and may also serve to distinguish species.

Species. Currently 20 species are assigned to the genus, ranging from the Middle Jurassic to the Late Cretaceous. Because the genus was created without any illustration of the type species showing thin sections, and because the genus remained unrevised until Beauvais (1982), its characteristics were unknown for a long time. Thus, it cannot be claimed that all these species belong to *Brachyseris*. *Brachyseris sensu stricto* has irregular calicular rows and shows collines that are developed in two different levels; such characteristics are not shared by the Early Cretaceous material (e.g. corresponding to the morphology of "*Brachyseris*" *felixi*).

Range. Very probably from the Late Turonian to the Santonian.

Brachyseris morchella Reuss, 1854

Fig. 1.1-2; Fig. 2.1-4

Type. The holotype is specimen NHMW 1864/0040/1321 (Vienna), by monotypy.

Synonymy

*v 1854 *Latomaeandra morchella*; Reuss: 107, pl. 21, figs. 9, 10

v non 1873 *Isastraea morchella* Reuss; Stoliczka: 36, pl. 7, figs. 7, 8
 ? 1880 *Latomaeandra morchella*; Quenstedt: 886, pl. 177, fig. 53
 ? 1899 *Isastraea morchella* Reuss; Söhle: 46, pl. 10, fig. 5
 ? 1903 *Latimaeandraraea morchella* Felix (Reuss sp.); Felix: 217
 1956 *Latimeandra morchella* Reuss, 1854; Wells: 381, fig. 269.7
 non 1976 *Thamnoseris morchella* (Reuss 1854); Turnšek & Buser: 25, 46, pl. 19, figs. 1-3
 non 1980-81 *Isastrea morchella* (Reuss); Abed & El-Asaad: 277, pl. 1, fig. 6
 v 1982 *Brachyseris morchella* (Reuss) 1854; Beauvais, 2: 236, fig. 99, pl. 44, fig. 3; pl. 68, fig. 4
 v non 1983 *Brachyseris morchella* (Reuss, 1854); Reyeros: 22, pl. 9, figs. 2, 3 [= *Astraeofungia felix*]
 v non 1997 *Thamnoseris morchella* (Reuss, 1854); Baron-Szabo: 89, pl. 16, fig. 1 [= *Microsolena guttata*]
 ? 2003 *Thamnoseris morchella* (Reuss, 1854); Baron-Szabo: 141, pl. 19, fig. 6; pl. 21, fig. 2

Dimensions (Table 2)

Remarks. The species cannot be assigned to *Thamnoseris* as proposed by various authors. This genus is a *nomen dubium*; the type of the type species *Thamnoseris incrustans* has never been illustrated nor was the type recently examined (presumably it is lost). Roniewicz (1979) gives very detailed information on the morphology of the genus, but this is without taxonomical value because it is based on another type species, and even from this species no type material was studied.

	n	min-max	μ	σ	cv	$\mu \pm \sigma$
NHMW 1864/0040/1321						
calicular row width	6	3.03-3.6	3.37	0.19	5.8	3.17-3.56
calicular row distance	6	3.36-4.38	3.68	0.40	10.8	3.28-4.08
distance of calicular centres	4	1.82-2.67	2.30	0.35	15.2	1.95-2.66
number of septa	4	40-42	41.5	1.0	2.4	40.5-42.5
density of septa		12/2 mm				
MHE A0415						
calicular row width	15	3.09-4.10	3.67	0.28	7.8	3.38-3.95
calicular row distance	20	3.26-4.88	4.14	0.48	11.7	3.65-4.63
number of septa	10	33-46	39.2	4.44	11.3	34.8-43.6
density of septa		16/5 mm				
MGB 20522						
calicular row width	15	2.52-3.82	3.26	0.37	11.4	2.89-3.63
calicular row distance	15	2.53-4.23	3.58	0.56	15.7	3.01-4.13
distance of calicular centres	5	1.71-2.56	2.18	0.31	14.1	1.87-2.49
number of septa	10	28-43	34.4	4.9	14.1	29.5-39.3
density of septa		5/2 mm				

Table 2. Dimensions of the holotypes NHMW 18/004/1321 and MGB 20522, as well of specimen MHE A0415.
 Tabla 2. Dimensiones de los holotipos NHMW 18/004/1321 y MGB 20522, así como del ejemplar MHE A0415.

"*Brachyseris*" felixi (Angelis d'Ossat, 1905)

Fig. 3.1-4

Type. Holotype MGB 20522 (Barcelona) by monotypy. Two thin sections from the holotype.

Synonymy

- *v 1905 *Latimaeandraraea Felixi*; d'Angelis d'Ossat: 190, pl. 14, fig. 4
- v 1937 *Maeandraraea Felixi* de Angelis sp. 1905; Bataller: 208, fig. [refiguration after d'Angelis d'Ossat]
- v 1947 *Maeandraraea Felixi* de Angelis sp. 1905; Bataller: 75, text-fig. [refiguration after d'Angelis d'Ossat]
- ? 1990 *Latimaeandraraea felixi* (de Angelis d'Ossat); He & Xiao: pl. 18, fig. 3

Dimensions (Table 2)

Diagnosis. Meandrinoid colony. Calicular outline polygonal, centres slightly depressed, rows very short (with 1-3 calices) and straight. Calices distinct. Septa perforated at their inner margin. Microstructure of large trabeculae. Septa in cross section externally thick, getting thinner towards the centre. Symmetry of septa irregular. Septal generations cannot be distinguished. All septa reach almost to the calicular centre. Septa rarely connected to each other. Septal upper border coarsely granulated, lateral face with pennulae and thorns, inner margin smooth. Pali or paliform lobes absent. Costae present, confluent. Synapticulae occasionally present, mainly in the wall

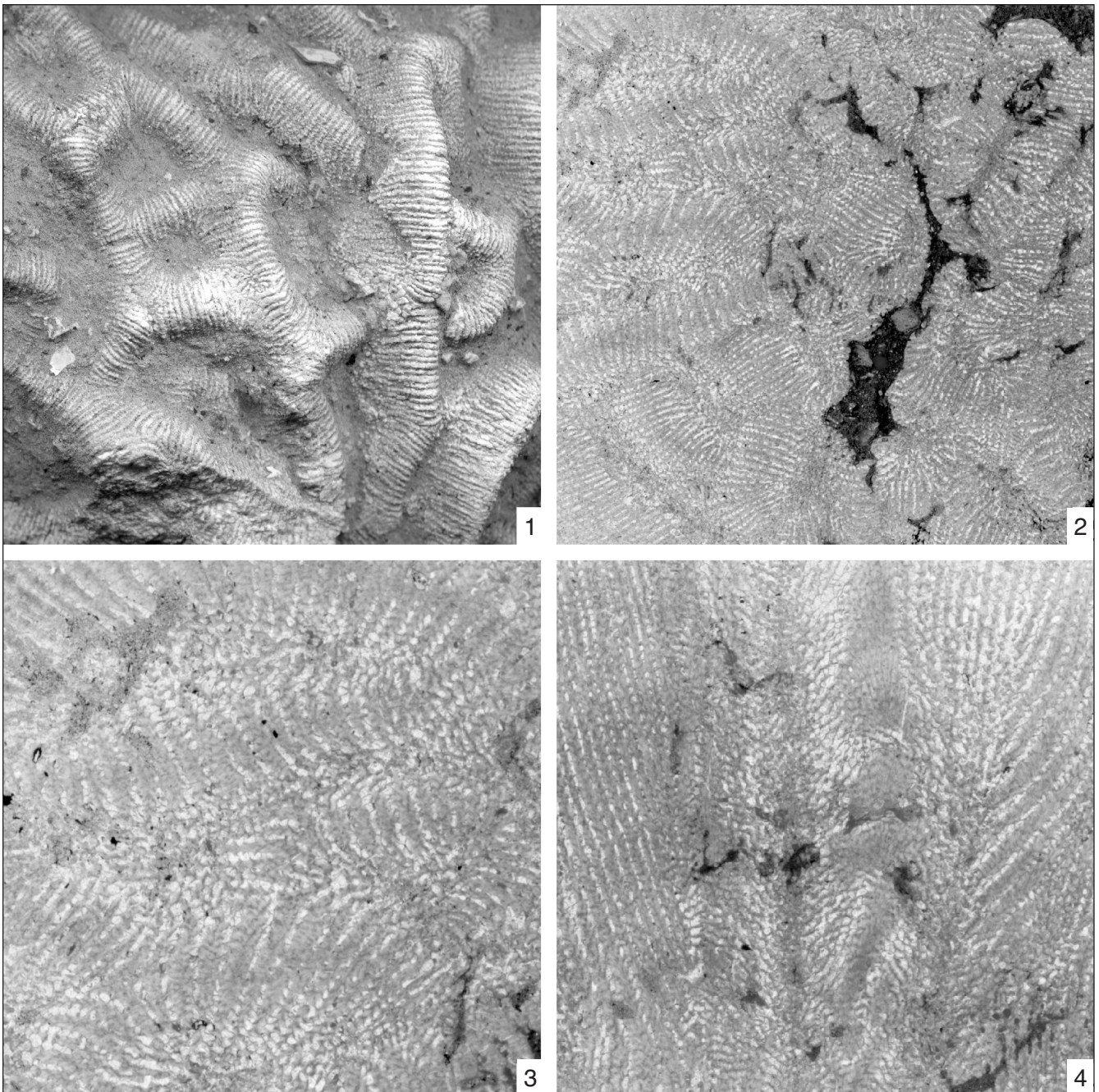


Fig. 2. *Brachyseris morchella* (Reuss, 1854). MHE A0415: 1, colony surface; 2-3, transversal thin section; 4, longitudinal thin section.

Fig. 2. *Brachyseris morchella* (Reuss, 1854). MHE A0415: 1, superficie de la colonia; 2-3, lámina delgada transversal ; 4, lámina delgada longitudinal.

region. Columella consisting of isolated granules or one more solid element. Endotheca consists of thin tabulae. Wall present, not compact, synapticulothecal. Coenosteum absent. Budding intracalicular, polystomedal and complete.

Remarks. The species differs from *Brachyseris morchella* by more regular calicular rows and the absence of pronounced collines.

Occurrence. Early Albian (Tardefurcata Zone) of Can Morgades (Mun. Castellví de la Marca, Com. Alt Penedès, Barcelona province, Catalonia, Spain).

DISCUSSION

Brachyseris sensu stricto is a well defined coral genus that is restricted to the Late Cretaceous. Early Cretaceous corals with short calicular rows differ by a more regular pattern and less pronounced collines. For the moment it does not seem justified to create a new genus for this material, because too many species are unknown, but "*Brachyseris*" *felixi* would probably be a good candidate for a type species.

Brachyseris minusculus Eliášová, 1994: the species shows no calicular rows and may belong to *Polyastropsis*. *Brachyseris montemarina* Hamilton, 1956: the type

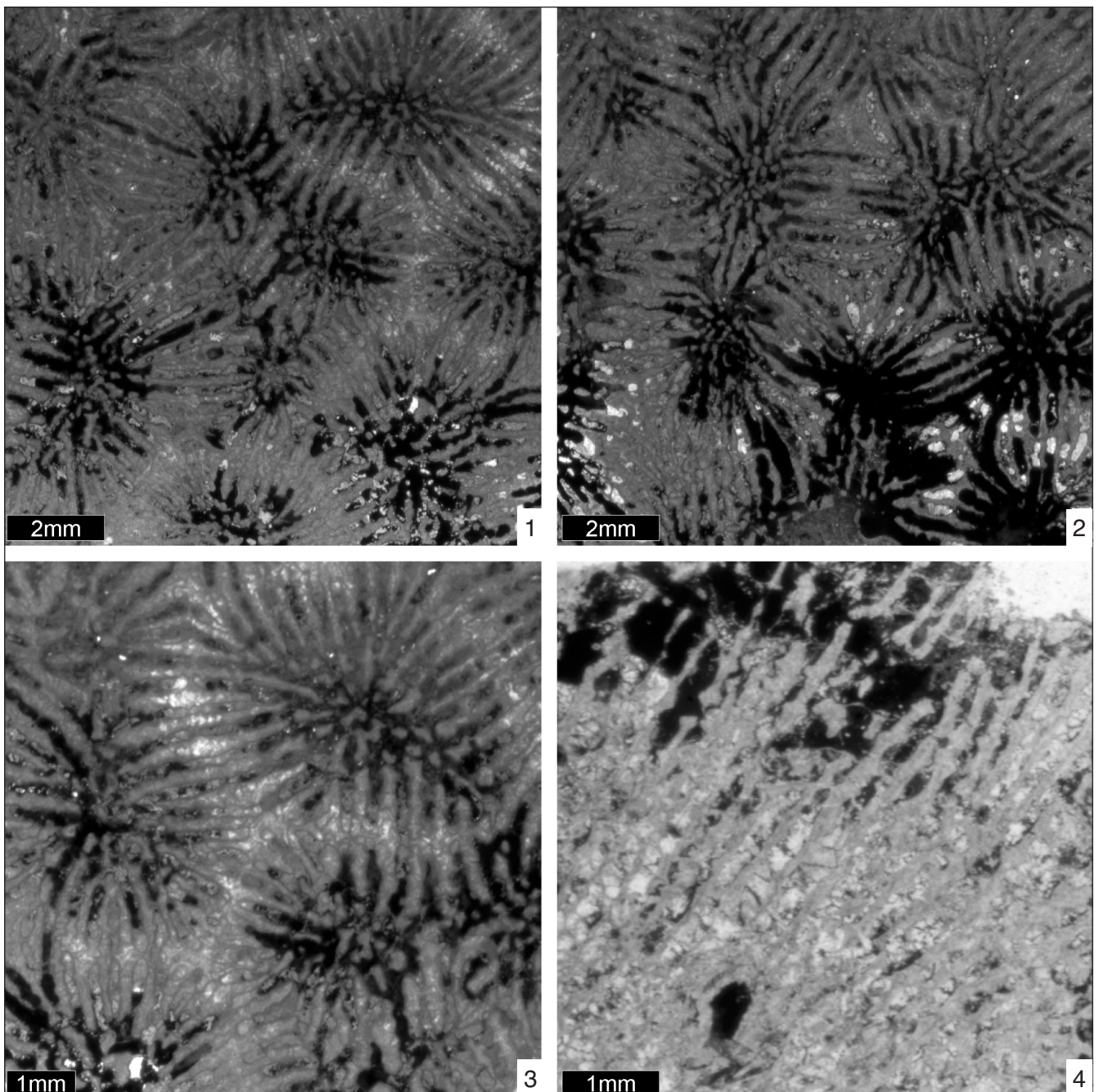


Fig. 3. "*Brachyseris*" *felixi* (Angelis d'Ossat, 1905). Holotype MGB 20522: 1-3, transversal thin section ; 4, longitudinal thin section.

Fig. 3. "*Brachyseris*" *felixi* (Angelis d'Ossat, 1905). Holotipo MGB 20522: 1-3, lámina delgada transversal; 4, lámina delgada longitudinal.

specimen is a small unsectioned specimen that is indeed very close to *Brachyseris* s.s. *Brachyseris paderensis* Alloiteau, 1948: the type material is lost; no comparable material could be found (see Löser, 2013 for discussion). *Brachyseris silex*, Eliášová, 1994: the species shows no calicular rows and may belong to *Polyastropsis*. *Brachyseris wellsii* Hamilton, 1956: the type specimen is an unsectioned specimen that is not well preserved and hardly allows diagnosis. *Latimaeandraraea submorchella* Angelis d'Ossat, 1905: the type material is probably lost; a diagnosis is not possible. Many authors assigned the species to *Maeandraraea*. *Latomeandra angulosa* Reuss, 1854: the type material is not available; Beauvais (1982) assigned the species to *Brachyseris*. *Latomeandra astraoides* Reuss, 1854: the type material is not available; Beauvais (1982) assigned the species to *Brachyseris*. *Meandraraea tenerrima* Oppenheim, 1930: the type material was not at hand; Beauvais (1982) assigned the species to *Brachyseris*.

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