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ALBIAN CORALS FROM THE SUBPELAGONIAN ZONE OF CENTRAL GREECE (AGROSTYLIA, PARNASSOS REGION)

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Abstract: Shallow-water scleractinian corals from Cretaceous allochthonous sediments of the Subpelagonian Zone in Agrostylia (Parnassos region, Central Greece) represent 47 taxa belonging to 35 genera, 15 families and 8 suborders; of these 3 new genera and 9 new species are described. Among these taxa, 5 were identified only at the generic level. One octocorallian species has also been identified. This coral assemblage is representative for late Early Cretaceous Tethyan realm but also shows some endemism. A characteristic feature of this scleractinian coral assemblage is the abundance of specimens from the suborder Rhipidogyrina. The Albian age of the corals discussed is indicated by the whole studied coral fauna, associated foraminifers, calpionellids and calcareous dinoflagellates.

Key words: Scleractinia, Octocorallia, Parnassos, Greece, Albian, taxonomy, palaeogeography.

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INTRODUCTION

Several occurrences of Cretaceous scleractinian corals from Greece have been mentioned in the literature (see e.g., Celet, 1962), but not many taxonomic studies have been carried out on these faunas. Hackemesser (1936) was the first to describe rich coral assamblages from Panourgias (formerly Dremisa) in Giona Massif (Central Greece). The age of this fauna has been dated by Hackemesser (1936, see also Renz, 1930 and Celet, 1962) as Cenomanian (perhaps not older than early Cenomanian, see Löser & Raeder, 1995). A year later Hackemesser identified five coral species from Agrostylia valley in the Parnassos region, dating their age also as Cenomanian (Hackemesser, 1937).

A few Cenomanian scleractinian corals from Macedonia were described by Brunn (1956); Upper Cretaceous corals from the Vermion Mountains by Mitzopoulos (1959), and "basal Cretaceous" and Cenomanian from Peloponnesus by Alloiteau (Alloiteau & Dercourt, 1966).

In the last decade some taxonomic studies have been performed by: Gameil (Abdel-Gawad & Gameil, 1995) on the Aptian, Albian and Upper Cretaceous corals from Boeotia and Santonian–Campanian ones in Macedonia; Löser on Aptian–Albian (Löser & Raeder, 1995) and late Turonian–Early Coniacian (Löser, 1999) corals from Boeotia; Baron-Szabo (Baron-Szabo & Steuber, 1996) on Aptian corals in early Tertiary flysch deposits from Parnassos, near Delfi-Arachova; Morycowa & Marcopoulou-Diacantoni (1997) and Morycowa & Kołodziej (2001) on corals from the Agrostylia valley in Parnassos (Albian, corrected from Albian– ?Cenomanian).

Shallow-water corals presented here were collected by A. Marcopoulou-Diacantoni in 1993 and by both authors in 1997 from Cretaceous sediments in the Agrostylia area, situated about 25 km NNW of the village Arachova, in the Parnassos region, Central Greece (Fig.1). The corals occur in allochtonous Cretaceous sediments belonging to the Subpelagonian Zone (Hackemesser, 1937; Celet, 1962; Maps IGME, Sheet Amphissa, 1: 50000, 1960). In the above mentioned literature, the age of coral-bearing sediments and the corals were estimated as Cenomanian. It should be mentioned that five species described in 1937 by Hackemesser come from the same area and perhaps from the same deposits as those collected by the authors.

Recently, studies of the coral specimens collected at Agrostylia have been undertaken and their age was first indicated as Albian–?Cenomanian on the basis of some coral taxa (preliminary note: Morycowa & Marcopoulou-Diacantoni, 1997) and later affirmed as only Albian on the basis of the corals and foraminifers occurring together with the coral skeletons (Morycowa *et al.*,1999; Morycowa & Kołodziej, 2001). Now the Albian age of these corals seems to be reaffirmed also by calpionellids and calcareous dinoflagellates.

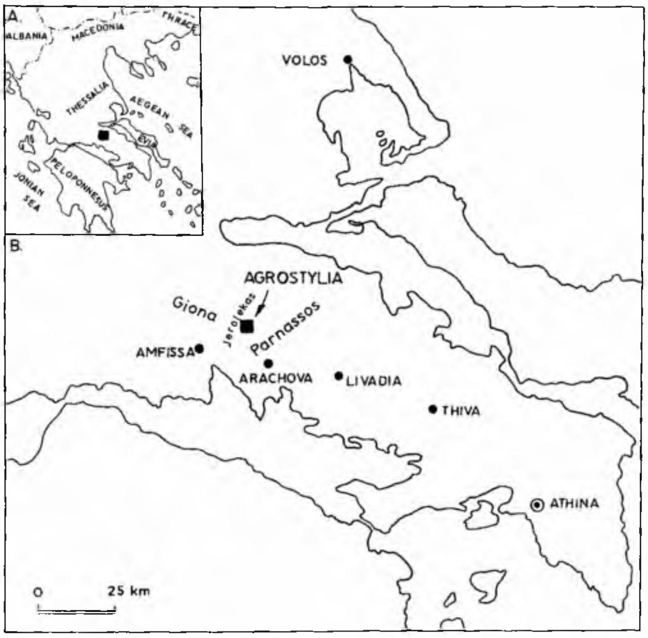

Fig. 1. **A, B.** Schematic maps showing location of Agrostylia area in the Parnassos region, Central Greece. Black square – location of the studied area

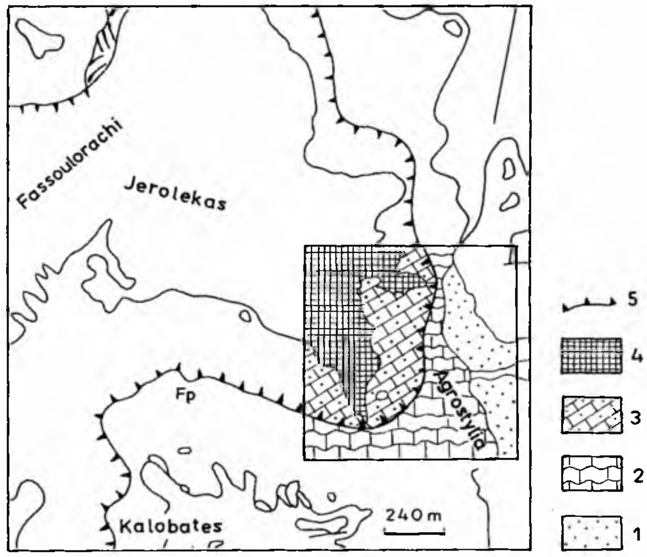

Fig. 3. Schematic geological map of the Parnassos region. Square inset shows localization of Agrostylia area (Sheet Amphissa, 1: 50 000. IGME, 1960) (simplified fragment of fig. 2; Morycowa & Marcopoulou-Diacantoni, 1997). *1* – Upper Jurassic–Lower Cretaceous; *2* – black limestones with corals; *3* – marly limestones and limestones with rudists and grey limestones with *Toucasia*; *4* – flyschoid deposits and limestones with orbitolines and gastropodes; *5* – overthrust line

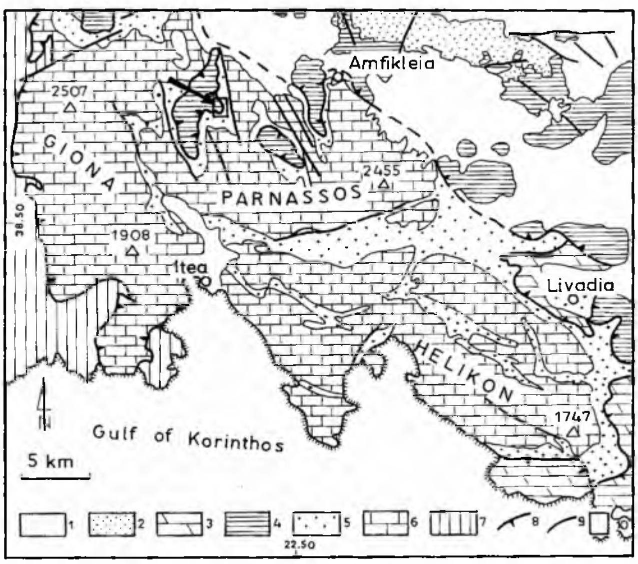

Fig. 2. Geological map of the Parnassos-Giona region, Central Greece, showing tectonic position of the Subpelagonian Unit (slightly modified fragment from Kranis & Papanikolaou, 2001, fig. 1, according to the information received from Dr. H. D. Kranis). *1* – Quaternary and Neogene; *2* – ophiolite suite; *3* – Boetian Units; *4* – Subpelagonian Unit; *5–6* – Parnassos Unit (*5* – clastics, *6* – carbonates); *7* – Pindos Unit; *8* – major tectonic contact; *9* – fault; *10* – location of the studied area, arrow

The coral assemblage represents 47 taxa belonging to 35 genera, 15 families and 8 suborders; of these 3 new genera and 9 new species are described. Among these taxa, 4 were identified only at the generic level. One octocorallian species has also been identified. This coral assemblage is representative for late Early Cretaceous Tethyan realm but also shows some endemism. A characteristic feature of this scleractinian coral assemblage is the abundance of specimens with neorhipidacanth microstructure, typical of the suborder Rhipidogyrina.

The principal aim of this paper is the taxonomic identification and re-examination of the whole coral assemblage collected from Agrostylia from 1993 to 1997 (Morycowa & Marcopoulou-Diacantoni, 1997; Morycowa *et al.*, 1999; Morycowa & Kołodziej, 2001) and the presentation of their stratigraphic and palaeogeographic distributions as well as their palaeoecological interpretation. Another important purpose is the reaffirmation of their Albian age on the basis of the whole studied coral fauna and the associated microfossils.

The geological part of this work is by A. Marcopoulou-Diacantoni and E. Morycowa, the palaeontological part by E. Morycowa.

The specimens presented here are housed in the Geological Museum of the Institute of Geological Sciences, Jagiellonian University (coll.: UJ 158P).

GEOLOGICAL SETTING OF THE AGROSTYLIA AREA (NW PARNASSOS)

The Greek mainland has been divided in two facial Zones called External and Internal Hellenides (Brunn, 1956; Aubouin, 1958). The Subpelagonian Zone is one of the Internal Hellenic Zones.

The locality in Agrostylia valley is situated in the area where the source Krya Vryssi flows out and belonging to the village Drossochori. The valley is flanked eastward by

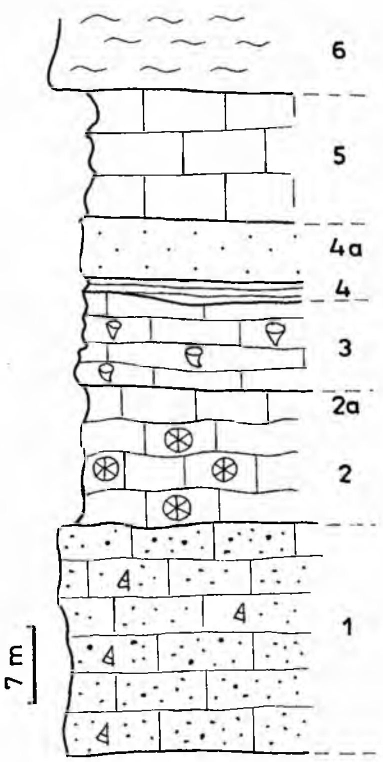

Fig. 4. Lithostratigraphic column of the Subpelagonian Zone at Agrostylia (after A. Marcopoulou-Diacantoni in: Morycowa & Marcopoulou-Diacantoni, 1997, fig. 3, slightly graphically modified). *1* – black to grey bituminous limestones with *Nerinea* (Jurassic/Cretaceous); *2* – black limestones with corals (Albian) (*2a* – intercalations of grey limestones with *Toucasia* (Cenomanian–Turonian)); *3* – marly, reddish limestones with small clasts of red cherts and fragments of rudists (Turonian–Senonian); *4* – polymictic material: grey limestones and a series of clay-sandstones poorly cemented, containing pebbles of serpentines and red cherts (4a), and lenses of limestones with orbitolinids, gastropods (*Nerinea*), rudists (*Radiolites*), corals (Senonian); *5* – white limestones (Senonian); *6* – flyschoid deposits (Senonian–Paleocene)

massif of the Parnassos mountain and westward by massif of the Jerolekas (Figs 1, 2).

According to the literature (Hackemesser, 1936; Celet, 1962, p. 176–177; geological map of IGME, Scheet Amphissa, 1: 50 000, 1960) as well as the data provided by A. Marcopoulou-Diacantoni (see Morycowa & Marcopoulou-Diacantoni, 1997), the deposits of the studied area come from the allochtonous series of the Parnassos area overthrust on the Parnassos Unit (Figs 2, 3) and they belong to the Subpelagonian Unit (Zone), known also as Eastern Greece Zone.

The Parnassos Unit is a thick neritic carbonate sequence (1500–2000 m) (U. Triassic–Paleocene). It terminates with a typical clastic sequence (flysch) at the Paleocene. The Subpelagonian Unit comprises a carbonate platform (U. Triassic–M. Jurassic). These platform sediments evolve into a clastic sequence (M.-U. Jurassic) followed by a carbonate sedimentation of the Late Cretaceous and deposition of the flysch in the Danian (Kranis & Papanikolaou, 2001). The corals and associated microfossils from Agrostylia indicate that late Lower Cretaceous (Albian) rocks are also represented in the Subpelagonian Zone.

In the locality of Agrostylia it is difficult now to observe a continuous stratigraphic section because of the density of vegetation. The lithostratigraphical section presented here (Fig. 4) (after the data provided by the second author: A. M.-D.) shows the position of the carbonate rocks containing coral specimens presented in this paper.

MATERIALS AND METHODS

The corals from Agrostylia (named also Argostilia) belong to the collection of A. Marcopoulou-Diacantoni, supplemented by E. Morycowa and G. Diacantonis. The specimens in question occur as separate colonies and in a debris of coral-bearing, mainly black, limestone fragments of various size (even blocks), lying at the base of a slope in Agrostylia area whose exact stratigraphic position is not known for certain (see also Celet, 1962, p. 177).

The coral assemblage consists of 5 solitary specimens and about 120 colonial forms. It has been possible to identify only about 90 of them.There are whole colonies ranging from several centimeters to over 50 cm in size, as well as fragments of coral skeletons. Massive and phaceloid growth forms are predominant. The taxonomical investigation of corals from Agrostylia was based mainly on the morphology and microstructure of the skeletons, which in some cases are relatively well preserved. The detailed investigation of the microstructure was based on ca 200 transverse and longitudinal thin sections, of which about 70 had been made at the Department of Historical Geology and Paleontology, Athens University, other in the Institute of Geological Sciences, Jagiellonian University. These investigations were made with the help of the optical and scanning electron microscope.The chemical composition of skeletons (8 analyses) was also studied. The microanalysis (SEM-EDS method) (Fig. 5A) show a similarity in elemental composition of the skeletons studied, which suggests that they underwent similar diagenetic processes, and the mineralogic analyses of the skeleton based on X-ray diffraction patterns indicate that the main material of coral skeleton is calcite with a small amount of aragonite (Fig. 5B).

The limestones filling and surrounding corals skeletons are mainly micritic, pelmicrosparitic or biointramicritic, in places limonitized and silicified. In many thin sections there occur, beside the remains of macrofossils such as i.a. sclerosponges, annellids, bivalves, echinoderm plates and rare calcareous algae, also microfossils, among them foraminifers, dinoflagellates and rare calpionellids.

AGE OF INVESTIGATED CORALS

Shallow-water scleractinian and octocorallian corals, occur in the Cretaceous allochtonous sediments at Agrostylia in the Parnassos region (Figs 1, 2). From these sediments (Cenomanian after Celet, 1962) Hackemesser (1937) described five species of scleractinian corals (specifying their age as probably Cenomanian): *Pachygyra bellula* n.

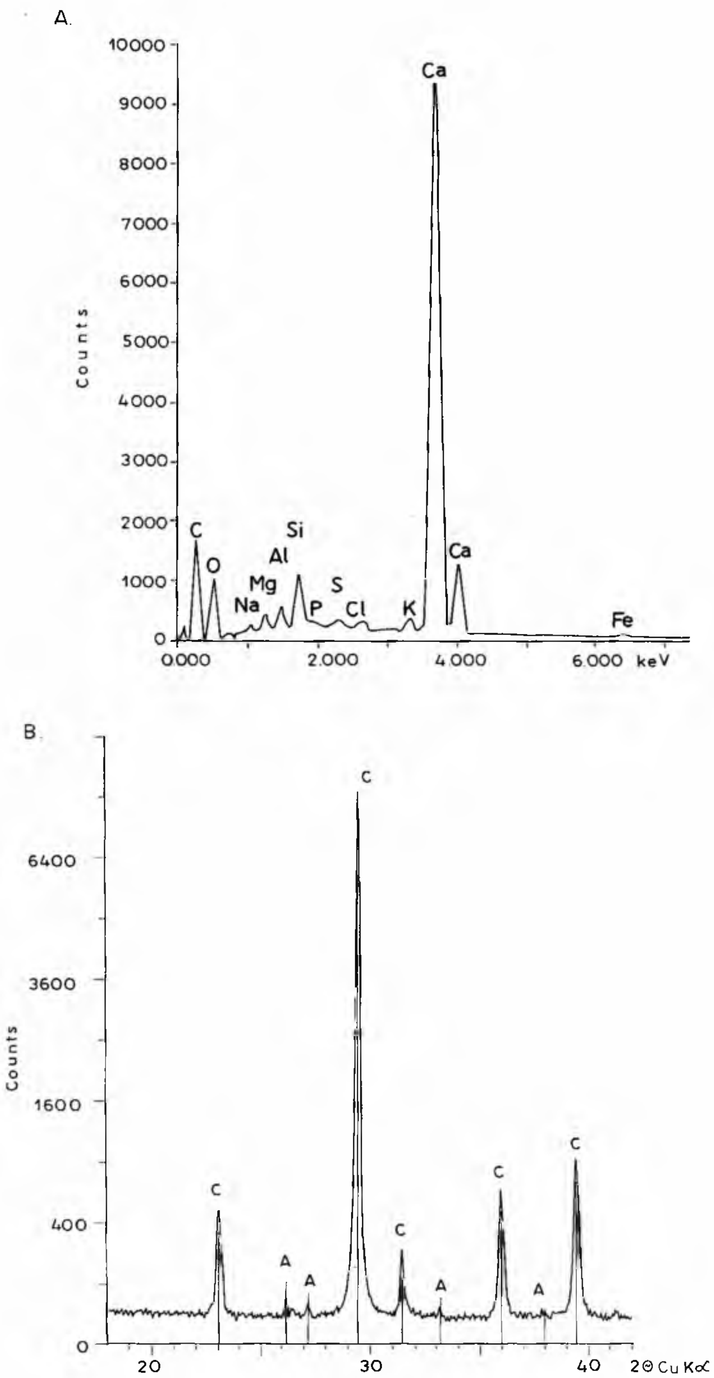

Fig. 5. **A**. *Preverastraea isseli* (Prever), UJ 158P 12. Chemical composition (SEM–EDS method) of the skeleton. **B.** Mineralogical composition of the skeleton based on X-ray diffraction patterns obtained by using the Philips diffractometer indicate that the main material of the studied coral skeleton is calcite with a very small amount of aragonite

sp., *Placocoenia* ex. aff. *niongalense* Dietrich, *Isastraea cyathina* Stoliczka var. *major* n.var., *Isastraea* ex. aff. *expansa* Stoliczka and *Hydnophyllia* n.sp. According to Celet (1962, p. 177) these corals were found in the black limestones "lenticulaires et emballés dans des marnes de sorte qu'il est très difficile de situer exactement leur position". Also A. Marcopoulou-Diacantoni (Morycowa & Marcopoulou-Diacantoni, 1997) is of the opinion that they derive from the black limestones. This is indicated also by dark limestone filling and embedding many skeletons of the studied corals.

The Albian–?Cenomanian age of the corals from the same site was estimated in the preliminary note presented by Morycowa & Marcopoulou-Diacantoni (1997). However, recent studies based on the whole coral assemblage suggest their Albian age.

CORAL ASSEMBLAGE FROM AGROSTYLIA VERSUS WORLD-WIDE CRETACEOUS CORAL COMMUNITIES

Among the corals studied there are species known from Valanginian to Senonian, the majority from Aptian to lower Cenomanian.

The assemblage is characterized by the presence of:

– surviving Jurassic relic taxa e.g. *Mitrodendron*;

– abundance of specimens from the suborder Rhipidogyrina (e.g. from *Preverastraea* genus);

– typical late Early Cretaceous taxa (Aptian–Albian), such as *Preverastraea*;

– distinctly dominating in specimens cosmopolitan Lower Cretaceous species (e.g., *Columnocoenia ksiazkiewiczi* Morycowa, *Calamophylliopsis fotisaltensis* Bendukidze);

– Late Cretaceous taxa, such as *Pleurocora* and *Latohelia* or even those known from the Tertiary as *Favia*;

– many new taxa, perhaps endemic ones (3 new genera and 9 new species in this paper and 2 new genera and 4 new species in Morycowa & Marcopoulou-Diacantoni, 1997).

Another distinct character of the assemblage is the absence of taxa characteristic of the shallow-water Lower Cretaceous assemblages, such as stylinids, cyathophorids and thamnasteriids.

If the corals are of the same age, the upper limit of their stratigraphic distributions could be suggested as early Cenomanian. "Mid Cretaceous" scleractinian assemblages (coral collections and literature) show that the changes in taxonomic compositions of shallow-water scleractinians occurred at the turn of early/late Cenomanian, and not, as is usually accepted, at the turn of Early and Late Cretaceous (Albian/Cenomanian). In the early Cenomanian typical and widely distributed in Late Jurassic and Early Cretaceous corals, such as: *Eugyra*, *Felixigyra*, *Amphiaulastraea*, *Preverastraea*, *Dimorphocoenia* disappeared. From the late Cenomanian–early Turonian new taxonomically different assemblages appeared with many new genera occurring together with older forms (e.g., *Negoporites*, *Siderastraea*, *Meandroria*, *Glenaraea*, *Saxuligyra*, *Olgastraea*) (see Eliášová, 1997b).

The lower age limit of the studied corals is indicated by the presence of the genera such as *Preverastraea*, known only from the Aptian–Albian. Thus the age of the corals from Agrostylia was within the interval Aptian–early Cenomanian. Since the Albian is the only hitherto known period in Cretaceous in which the rhipidogyrines developed so richly (Prever, 1909; Sikharulidze, 1979a; Löser, 1998c), the age of the discussed corals could be limited to the Albian only.

STRATIGRAPHIC DISTRIBUTION OF CORAL SPECIES FROM AGROSTYLIA

The Albian age of coral assemblage in Agrostylia is suggested also by the stratigraphic distribution of these species. The stratigraphic distribution based on 25 species identified with certainty (Fig. 6), i.e. without cf., aff. and new species (with one exception), is large, from Valanginian to Senonian, but over half of them (15) are known from the interval Aptian–Cenomanian (mainly lower Cenomanian), 15 species among these 25 occur in the Albian (i.e., they appeared in the Albian – 5 species of which 4 occur only in Albian), or they disappeared in that stage (10 species, among them 4 mentioned above as appearing in the Albian). The distribution of the corals is given below (see also Fig. 6):

Valanginian–**Albian** – 1 species,
Hauterivian–Aptian – 1 species
Hauterivian–**Albian** – 2 species,
Barremian–(early) Aptian – 2 species
Barremian–**Albian** – 2 species,
Barremian–Aptian–**Albian**–Cenomanian – 2,
Early Aptian – 2 species,
Late Aptian–Early **Albian** – 1 species,
Aptian–**Albian**–Cenomanian – 2 species,
Albian – 4 species,
Albian–Cenomanian – 1 species,
Cenomanian – 3 species
Cenomanian–Senonian – 1 species,
Senonian – 1 species.

STRATIGRAPHIC VALUE OF MICROFOSSILS

The Albian age of the studied corals of Agrostylia is indicated also by the foraminifer morphotypes occurring together with the coral skeletons (kindly identified by Dr. hab. M. A. Gasiński) as *Tritaxia* (*Clavulinoides*) ex gr. *gaultina* (Morozova) (Fig. 7A), *Marssonella* (*Dorothia*) cf. *trochus* (Reuss) (Fig. 7B), *Marsonella* (*Dorothia*) sp. Orbitolinids (Fig. 7 J, K) occurring in these associations (observed in the thin sections) are not determined due to the absence in the sections of proloculus. Moreover, we found in many thin sections made from coral-bearing limestones Albian planctic microfossils (kindly verified and some identified by Dr. D. Reháková) (see also Reháková, 2000; Vašiček *et al.*, 1994), such as calpionellids: *Colomiella recta* Bonet (Fig. 7I) and calcareous dinoflagellates as: *Cadosina semiradiata semiradiata* Wanner (Fig. 7E), *Colomisphera leporis* Řehánek (Fig. 7F). Other species, such as *Bonetocardiella conoidea* Bonet (Fig. 7D), *Pithonella sphaerica* (Kaufmann) (Fig. 7C) and *Cadosina semiradiata cieszynika* (Nowak) (Fig. 7H), (according to Reháková, 2000), have wider stratigraphic range. The first one is Albian–Cenomanian, the second – Albian–Upper Cretaceous, and the third: Valanginian–Albian.

PALAEOECOLOGY AND CHARACTERISTICS OF THE CORAL ASSEMBLAGE

Occurrences of shallow-water hermatypic-like Albian corals are relatively rare in the world. In the Tethyan region, the deepening of shallow seas during the Albian inhibited the growth and continuous development of large coral build-ups which are characteristic of Barremian and Aptian periods. Consequently, the occurrences of shallow-water scleractinian corals in the Albian are of importance for the reconstruction of the evolution, palaeogeography and palaeoecology of this group of invertebrates.

The mid-Cretaceous coral assemblage found in Cretaceous allochthonous sediments of the Subpelagonian Zone in Parnassos at Agrostylia grew in rather shallow sea (open shelf), in an environment with sedimentation of dark pelites and influence of open sea. The shallow enviroment is indicated by the character of the corals themselves as well as by the organisms associated with them, mainly orbitolinids and calcareous algae (Dasycladaceae). The presence in the limestones of rather numerous planctic calcareous dinoflagellates and foraminifers suggest the influences of open sea during sedimentation and coral growth.

The characteristic features of the studied coral fauna, which differentiate it from almost all others known from this age, are: the abundance of specimens from the suborder Rhipidogyrina (among ca 90 specimens, 22 represent rhipidogyrines) (4 genera, 9 species and one taxon identified only at the generic level); the high percentage of new taxa, which may be endemic to this part of the Tethyan realm (here: 3 new genera and 9 new species and in Morycowa & Marcopoulou-Diacantoni, 1997: 2 new genera and 4 new species); the absence of the species from the genera such as: *Stylina*, *Pseudocoenia*, *Pentacoenia*, *Holocystis* (Stylinidae), *Cyathophora* (Cyathophoridae), *Montlivaltia* (Montlivaltiidae), *Felixigyra* (Faviidae), *Thamnasteria* (Thamnasteriidae), *Microphyllia* (Latomeandridae), *Microsolena* and *Meandraraea* (Microsolenidae), which constitute a very important component of most known Early Cretaceous shallow-water coral faunas from Europe (i.a. from Italy, Spain, France, Poland, Ukraine, Romania, Bulgaria, Hungary, Greece, Slovenia, Serbia, Georgia; de Fromentel, 1857, 1861, 1862a, 1862b–1887; Toula, 1889; Koby, 1896–1898; Angelis d'Ossat, 1905a, b; Prever, 1909; Bataller, 1937, 1947; Alloiteau, 1948, 1958; Kuzmicheva, 1960, 1980; Morycowa, 1964, 1971; Zlatarski, 1968; Turnšek & Buser, 1974; Sikharulidze, 1977, 1979b, 1985; Turnšek & Mihajlović, 1981; Bugrova, 1990; Baron-Szabo, 1993, 1997; Morycowa & Decrouez, 1993; Abdel-Gawad & Gameil, 1995; Löser & Raeder, 1995; Baron-Szabo & Steuber, 1996; Baron-Szabo & Fernandez-Mendiola, 1997; Morycowa & Masse, 1998; Schöllhorn, 1998), Azerbaijan, Tanzania, Tibet, Japan, Mexico, Venezuela, and USA (i.a., Dietrich, 1926; Wells, 1932, 1944; Eguchi, 1951; Reyeros de Castillo, 1983; Liao & Xia, 1985; Kuzmicheva, 1988; Baron-Szabo & Gonzales-León, 1999).

The coral assemblage from Agrostylia shows a certain similarity, in view of the presence of rather numerous rhipidogyrine taxa, to shallow-water coral assemblages from the

Species \ Distribution	Spain	Italy	France	Belgium	Switzerland	Germany	Austria	Slovakia	Czech Rep.	Poland	Ukraine	Romania	Hungary	Slovenia	Serbia	Greece	Bulgaria	Georgia	Turkmenistan	Azerbaijan	Egypt	Tibet	Chile	Mexico	Tithonian	Berriasian	Valanginian	Hauterivian	Barremian	Aptian	Albian	Cenomanian	Turonian	Senonian
Amphiaulastrea minima (Prever)		Al														A														- -	—			
Heterocoenia minuta Morycowa nom. nov.												A1																		—				
Heliocoenia triradiata Morycowa									Ti-Be			A1													- -	- -				—				
Agathelia minor Reig Oriol	Cam																																	—
Aulastraeopora aff. *deangelisi* Prever		Al														A						not A1-Al								- -	- -			
Preverastraea felixi (Hackemesser)																Cen																—		
Preverastraea diplothecata (Hackemesser)																Cen																—		
Preverastraea isseli (Prever)		Al				Cen																Al-Cen									—	- -		
Parnassomeandra diacantoniae n. sp.	A/Al																													—	—			
Actinastrea aequibernensis (Hackemesser)																A/Al Cen														—	—	—		
Actinastrea major Morycowa												A1			B-A1							H-A1							—	—				
Plesiofavia dubia (de Fromentel)			H												B-A1													—	—					
Myriophyllia propria Sikharulidze						A1	A1						H			A/Al		Al						B2-Alm				- -	- -	—	—			
Eugyra aff. *arasensis* Alloiteau	A																													- -				
Eohydnophora aff. *crassa* (de Fromentel)		B-A	B, A1 U		U												A				Cen								- -	- -	- -	- -		
Ciausastrea magna Reig Oriol	Al																														—			
Peplosmilia fromenteli Angelis d'Ossat	A						Con1							B-A	B-A1	A			B			Al							—	—	—			- -
Tricassastraea aff. *parnassensis* Alloiteau																Cen																- -		
Columnocoenia ksiazkiewiczi Morycowa	A2 Al		A1			A1, Cen1	A1			B-A1	B-A	A1	H			A1 A/Al		B	B1	B			H-B	B2-Alm				- -	—	—	—	—		
Columnocoenia bucovinensis Morycowa						Cen1						A1			B-A1	A								B2-A1					—	—	—	—		
Neocoenia subpolygonalis Hackemesser							Con1									Cen																—		—
Calamophylliopsis fotisaltensis (Bendukidze)	A2 Al, U		A1			Con1 Tr-Cam				A2	H1			B-A-Alm														—	—	—	—			
Pleurocora aff. *alternans* M. Edwards & Haime				Cam				San2 Cam1																									- -	- -
Latomeandra minor Reig Oriol	Al																														—			
Ovalastrea baumbergeri (Koby)		Al			V													Al									—				—			
Latohelia reptans (Počta)						Cen2			Cen2																							—		
Latiastrea paronai (Prever)		Al														Cen															—	—		
Latiastrea mucronata Sikharulidze													H					Al						A2-Alm				—		—	—			
Mixastraea westfalica Löser						Cen1										A								Alm						—	—	—		
Hydnophoromeandraraea volzi Morycowa			B-A1			A1	A1					A1																	—	—				
Psedopolytremacis cf. *spinoseptata* Morycowa						Cen1	Con1					A1		B-A															- -	- -		- -		- -

Fig. 6. Stratigraphic and geographic distribution of the Albian coral species of the Agrostylia area, Parnassos region (Ti – Tithonian, Be – Berriasian, V – Valanginian, H – Hauterivian, B – Barremian, B1 – Early Barremian, B2 – Late Barremian, A – Aptian, A1 – Early Aptian, A2 – Late Aptian, Al – Albian, Al1 – Early Albian, Alm – Middle Aptian, Al2 – Late Albian, C – Cenomanian, C1 – early Cenomanian, C2 – late Cenomanian, Tr – Turonian, Con – Coniacian, San – Santonian, Cam – Campanian). Symbols in italics indicate species identified approximately (aff., cf., with ?) or only mentioned in the literature. Solid lines correspond to documented age of species, dashed lines indicate uncertain occurrences or the age of the species approximately identified. Grey areas show the age of the studied corals

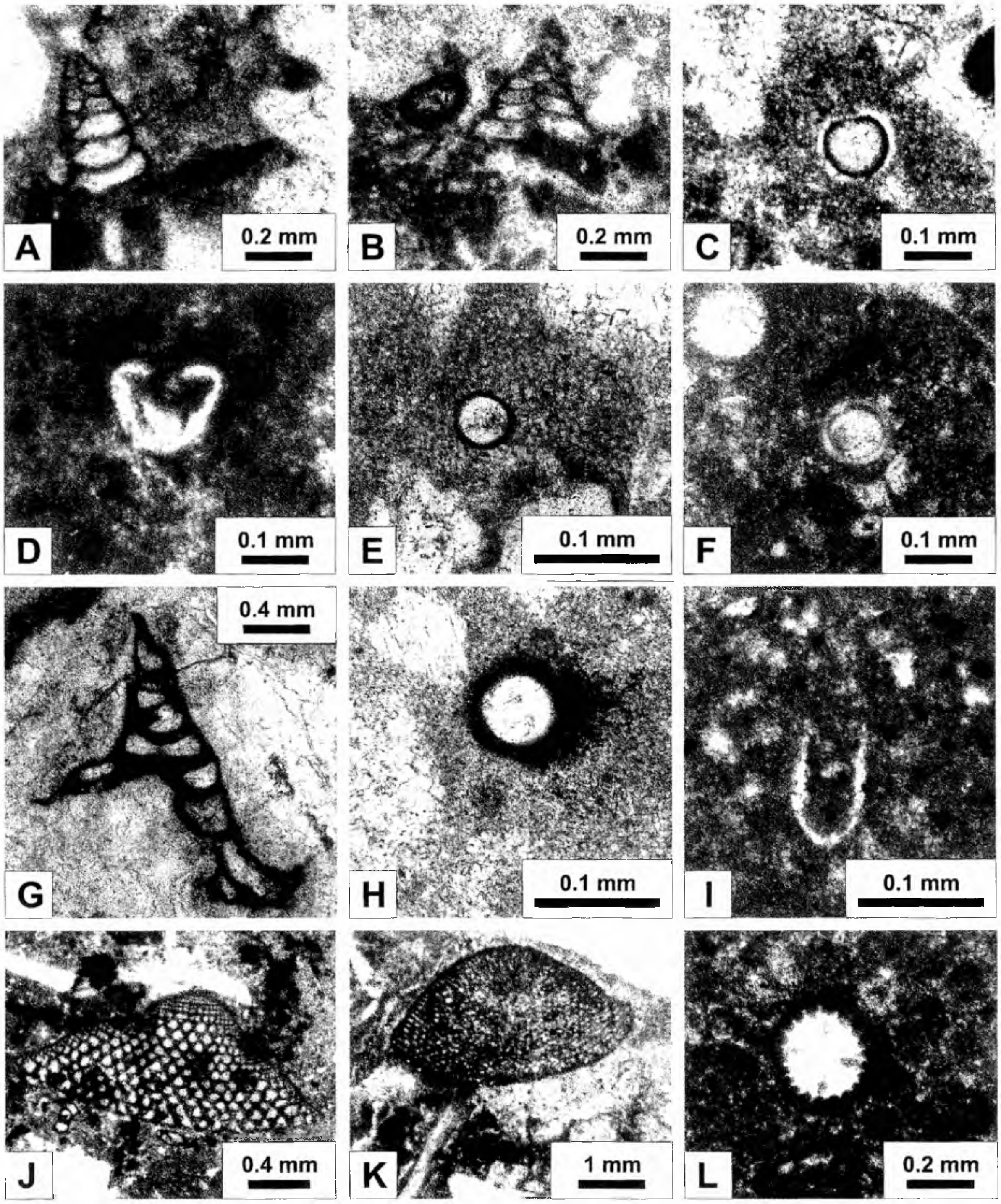

Fig. 7. Some microfossils (Foraminiferida, Dinoflagellata, Calpionellidae and Radiolaria) from the limestones filling and surrounding coral skeletons collected in Agrostylia area. **A, E, H.** Thin section (UJ 158P 65C) made from dark, in places reddish, limestone (biointramicrite) with corals *Calamophylliopsis* sp., co-occuring with: A – *Tritaxia* (*Clavulinoides*) ex gr. *gaultina* Morozova, E – *Cadosina semiradiata semiradiata* Wanner; H – *Cadosina semiradiata cieszynica* (Nowak) sensu Reháková (2000); **B.** *Marsonella* (*Dorothia*) cf. *trochus* (Reuss) occurring together with *Preverastraea felixi* (Prever) in the dark limestone (microsparite; thin section: UJ 158P 27b); **C, D, F.** Thin section (UJ 158P 90b) of the limestone surrounding skeleton of *Pleurocora* aff. *alternans* M. Edwards & Haime, with: C – *Pithonella sphaerica* (Kaufmann); D – *Bonetocardiella conoidea* Bonet; F – *Colomisphaera leporis* Řehánek; **G.** *Marsonella* (*Dorothia*) sp. from the grey limestone (intrasparite, thin section: UJ 158P 36a) occurring with *Apoplacophyllia hackemesseri* n.gen, n.sp.: **I.** – *Colomiella recta* Bonet in dark pellitic limestone (micrite; thin section UJ 158P 98b) with *Latiastrea paronai* (Prever); **J, K.** Orbitolinidae: J – from dark limestone with numerous miliolids (biopelmicrosparite; thin section: UJ 158P 107a) together with solitary indeterminate coral; K – from dark limestone (biomicrosparite, thin section: UJ 158P 28a) with *Paraacanthogyra parnassensis* Morycowa & Marcopoulou-Diacantoni; **L.** Radiolaria (Nassellaria) in transverse section (crossed nicols; thin section: UJ 158P 29a) co-occurring with *Meandroria* sp. in dark limestone (pelmicrosparite)

Albian in Abruzzi, Italy (two genera and nine species; Prever, 1909; age after Masse *et al.*, 1998), Georgia (seven genera and eight species; Sikharulidze, 1979a), and from (?)lower Cenomanian of Panourgias (old name Dremisa) in the Giona massif, Central Greece (two genera, three species; Hackemesser, 1936).

On account of the presence of common species, the coral assemblage from Agrostylia shows some similarity to a few shallow-water coral assemblages, each of which contains five common species: from the Aptian of Delfi-Arachova area, Greece (Baron-Szabo & Steuber 1996); Albian in Abruzzi, Italy (Prever,1909); and (?)lower Cenomanian of Panourgias, Giona region, Greece, (Hackemesser, 1936). Moreover, with the Aptian/Albian assemblage from Helicon Mountains, Greece (Löser, 1995) and early Cenomanian assemblage from Westphalia contain four common species (Löser, 1994).

STATE OF PRESERVATION AND SKELETAL MICROSTRUCTURE OF CORAL SKELETONS

There is convincing evidence that most probably all skeletons of living scleractinian corals are aragonitic. Similarly fossil scleractinians had originally aragonitic skeletons as is documented by many researchers with reference to both Triassic and younger corals (i.a. Felix, 1903; Morycowa, 1971, 1980; Cuif, 1972; Montanaro-Gallitelli *et al.*, 1973; Montanaro Gallitelli, 1974; Sorauf, 1978; Roniewicz, 1984).

However, the fossil scleractinian skeletons are commonly poorly preserved, on account of recrystallization of originally aragonitic skeletons into calcite, or sometimes replacement by silica (Morycowa, 1980). This leads to destruction or different modifications of the original skeletal microstructure. Well preserved skeletons occur where the corals are in relatively impermeable rocks as shales or marls, as in the case of Early Aptian corals in the Romanian Carpathians (Morycowa, 1971, 1980).

The microstructure of the skeletons is a very important suprageneric taxonomical criterion both for living and for fossil scleractinians, and together with such features as growth forms, morphology of corallites and microarchitecture of their skeletons makes possible their taxonomic identifications. It is also helpful in the case of morphological homeomorphs of corals from different systematic groups. Molecular investigations of scleractinian DNA and RNA sequencings (e.g., Veron, 1995; 1996; Romano, 1996; Romano & Palumbi, 1996; Cuif *et al.*, 1999; see also Stolarski & Roniewicz, 2001) will certainly modify in future the data concerning phylogenetic relations of coral families and suborders hitherto based mainly on skeleton morphology and microstructure. Unfortunately, in the present state of knowledge, the results of the molecular studies cannot be directly applied to entirely extinct groups of corals. In my consideration of coral skeletons, I do not touch upon the problem of scleractinian skeletogenesis, organic and mineral concept of coral skeleton (Sorauf, 1980; Cuif & Sorauf, 2001). My account of the microstructural features, mainly of septa and walls, based on traditional methods (Roniewicz & Morycowa, 1993) may be of use in the future for comparison with data obtained by other methods.

Microstructure of skeletons presents the microscopic picture of the development and arrangement of fibers (e.g., arranged in paralel structures, in bundles, radially, randomly), and the structure, sizes, and arrangement of trabeculae. The calcification centres, as shown in recent research, may be of considerable taxonomic importance (e.g., Cuif & Dauphin, 1998; Cuif & Sorauf, 2001).They are differentiated as structures, in sizes, shapes and crystallization features. In fossils, calcification centres are usually destroyed (Morycowa, 1980; Perrin & Cuif, 2001), micritized, replaced by sparite or silica, so their sizes and detailed structure cannot be exactly reconstructed.

I apply here corallite terminology proposed by Alloiteau (1952, 1957) and Wells (1956) with some complementary terms concerning microstructure and microarchitecture of skeletons.

The *trabecula* (lat. pl. – *trabeculae*) is defined as a rod formed by fibers, setting off from an axis. Structurally, trabeculae can be classified as:

– simple and compound (Ogilvie, 1896) or branching trabeculae as well as divergent trabeculae (with zigzag-shaped axis; Morycowa, 1971, text-fig. 30A, B; see also illustrations in Ogilvie, 1896, pl. 7, fig. 3; Morycowa, 1964, pl. 18, fig. 1b, c; Chevalier, 1971, fig. 173) (Fig. 8F).

– primary (main) trabeculae and secondary (lateral) trabeculae (when diverging from the axes of the main trabeculae) are used after Jell (1969). Main trabeculae can be mono- or polycentric (as, for example, in faviids; Figs 8G, 26B). The secondary trabeculae can occur laterally as in rhipidogyrines (Figs 8B, 14E, 16C, E, 17B, 18E), montlivaltiids, isastraeids (Fig. 28F) or radially, around the main trabecula, as in some faviids, montlivaltids and microsolenines.

Diameters of trabeculae (measured in transverse sections) are used here after Morycowa & Roniewicz (1994):

– minitrabeculae up to 50 μm. In some cases minitrabeculae coalesce with each other and form mid septal-line, within which individual centres of calcification are indistinct, as in some septa of amphiastreids (Fig. 9A, D);

– medium-size trabeculae between 50 to 100 μm;

– thick trabeculae of diameters larger than 100 μm. In the studied material they rarely exceeded 500 μm (as in ?*Favia*, Fig. 25A).

The above classification is arbitrary and is used for convenience only.

Yet another important taxonomic criterion of supergeneric taxonomic groups, connected with microstructure, is skeletal mainly septal and wall ornamentation, occurring when the septal flanks are not thickened by fiber stereome. It occurs in lateral septal faces in various forms, dimensions and arrangements, as regularly or irregularly distributed granulations (in some taxa coalescing into *carenae* (strip-like forms where the granules of the orders arranged subperpendicularly to the distal border of radials elements are coalescent), as well as developed as pennules or/and menianes (English spelling). The terms are used after Gill (1967). Pennules (Lat., sing. *pennula*, pl. *pennulae*) – are serially

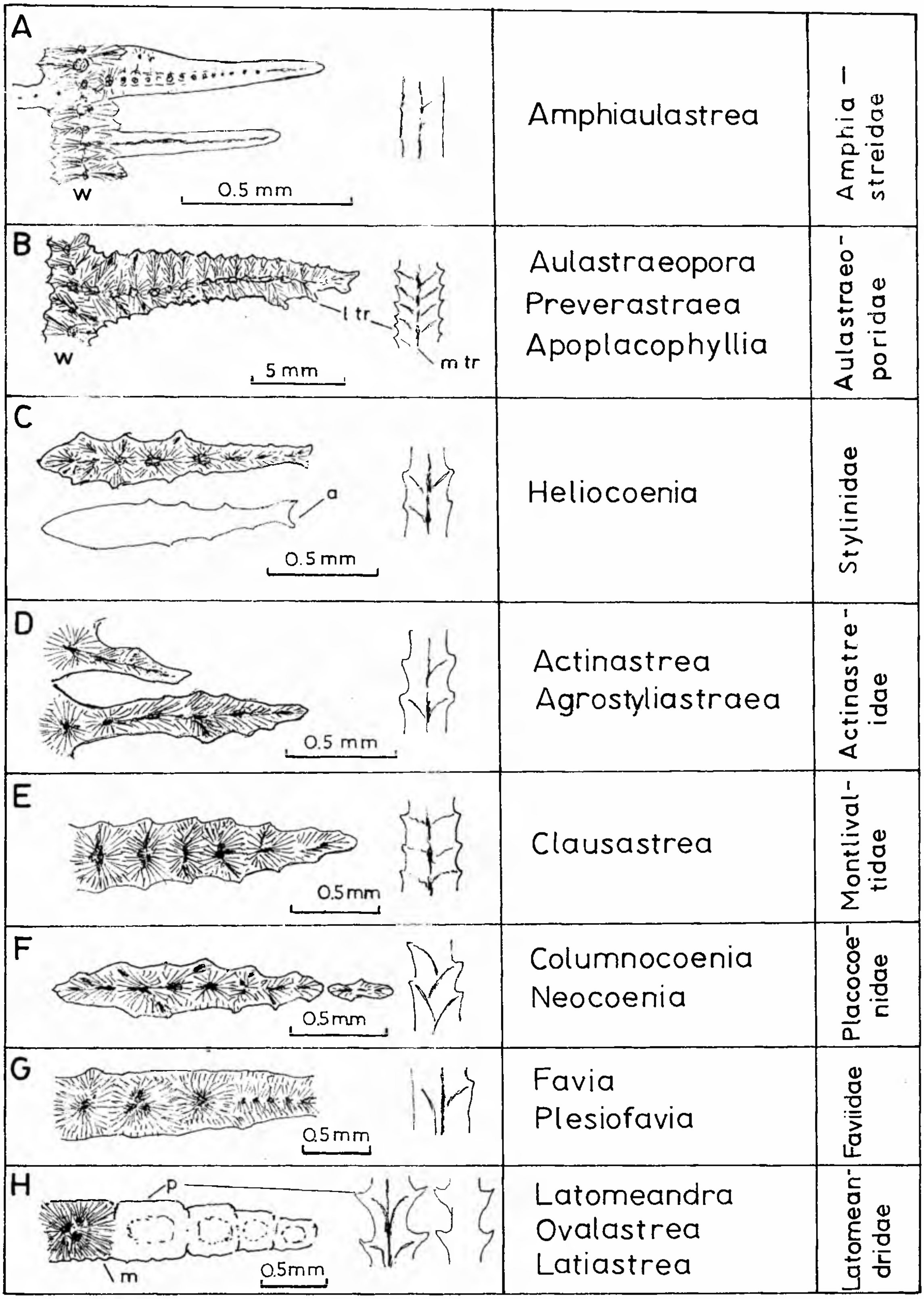

Fig. 8. Schematic illustrations of some Agrostylian coral microstructures (transverse and longitudinal sections of radial elements): **A** – mini-trabecular type; calcification centres separated or coalescing and forming straight mid-septal line; **B** – medium- to thick-sized, regularly branching trabeculae (neorhipidacanth-type); **C–E** – medium- to thick trabecular types: simple and irregularly branching, monocentric trabeculae; **F** – medium- to thick sized diverging trabeculae; **G** – medium- to thick trabecular type. Trabeculae mainly well separated; centres mono-or polyaxial; lateral flanks of septa frequently thickened by fibres; **H** – thick-trabecular type with pennules, menianes (irregular septal porosity in Latomeandridae and regular in Microsoleniidae); m tr – main trabeculae; l tr – lateral (secondary) trabeculae; a – auriculae, p – pennules, m – menianes. (For further explanation see the text : "State of preservation and skeletal microstructure of coral skeletons")

and regularly arranged collar-like forms (balconies) along the trabecula (as e.g., Figs 8H, 34D, 36E, 37). Menianes (Lat., sing. *menianum*, pl. *meniana*) – are more or less long collar-like forms (flange-like forms) developed mainly from coalescing of pennules (e.g., Figs 8H, 34D). Their origins can be diverse and characterize particular supragenetic coral groups.

The type of morphology of the inner border of septa, formed by trabecular expansion, can be in some cases an important taxonomic feature for higher-level scleractinian classifications. For example *auricula* (Lat., pl. *auriculae*), the term introduced by Gill (1977) for regularly distributed septal inner margin swellings with slight axial concavities (Figs 8C, 11H, I), is a feature occurring up to now only in the representatives of suborders Stylinina and Rhipidogyrina.

The majority of the families and even some suborders show the characteristic structure of trabeculae and trabecular diameters more or less stable in relation to the dimensions of radial elements. However, there are also higher-level (suprageneric) taxa, whose microstructure is less characteristic. In these cases some morphologic features of skeleton are important and sometimes decisive, as the presence of e.g. auriculae, lonsdaleoid septa (Amphiastreidae, Rhipidogyrina) and even, in some cases, the type of budding (e.g., budding by "Taschenknospung" = pocket-budding, in Amphiastreidae).

Some authors (Montanaro-Gallitelli, 1975; Eliášová, 1976; Chevalier & L. Beauvais, 1987; Roniewicz & Stolarski, 2001) distinguish high-level taxa (order or suborder) on the basis of the characteristic type of corallite walls – pachytheca.

Other skeletal elements such as pali (lat., sing. *palus*), paliform lobes , columella, endotheca and exotheca and type of budding (see Lathuilière, 1996, p. 82) are usually considered as diagnostic at generic level.

SOME REMARKS ON ARGOSTYLIAN CORAL MICROSTRUCTURE

The chemical microanalysis (SEM – EDS method) of the coral skeletons at Agrostylia shows a similarity in elemental composition of the skeletons (8 analyses, one is presented in Fig. 5A). The analyses of the skeletons based on X-ray diffraction patterns obtained by using the Philips diffractometer show the reflections of d-spacings: 3.86 Å; 3.038 Å; 2.844 Å; 2.497 Å; 2.286 Å. These reflections indicate that the main material of the studied coral skeleton is calcite (Fig. 5B). The presence of aragonite is documented by d-spacing: 3.40 Å; 3.27 Å; 3.703 Å; 2.37 Å, whose low intensity in comparison with calcite proves that there is very little aragonite in the skeleton.

In spite of rather strong recrystallization of the skeletons, their microstructure in many specimens may be reconstructed from the preserved traces of primary microstructure and where the microstructure was blurred by recrystallization, on the basis of the skeleton ornamentation. The microstructure of the Lower Cretaceous coral faunas from the Polish and Romanian Carpathians (Morycowa, 1964, 1971), Southern France (Morycowa & Masse, 1998) were helpful in the interpretation of the microstructure of some corals presented here.

Among the studied corals some groups with characteristic microstructure can be distinguished:

– minitrabecular structure of septa (*Amphiaulastrea*, *Mitrodendron*, family Amphiastreidae); lateral septal surfaces smooth or rarely with fine granulations;

– mainly thick-trabecular structure of septa (*Actinastrea*, family Actinastreidae); septal surface with rare, sharp, generally big, irregularly distributed granulations;

– considerably varying diameter and structure of trabeculae, as in *Favia*, *Plesiofavia* (family Faviidae); costoseptal lateral faces irregularly granulated or smooth;

– medium- to thick-size regularly branching trabeculae (neorhipidacanth trabeculae (i.a. *Aulastraeopora*, *Preverastraea*, family Aulastraeoporidae); rich, fine granulations in more external lateral surfaces of septa and internal wall surface; very prominent trabecular extensions in axial parts of septa;

– medium- to thick-size septal trabeculae, mainly divergent, as in *Columnocoenia* (family Placocoeniidae); septal faces with well developed, irregularly distributed granulations;

– medium- and thick-size, simple and, in majority, compound (branching) septal trabeculae. Secondary trabeculae usually in lateral disposition, as in Montlivaltiidae (here *Clausastrea*); lateral septal surfaces with granulations disposed subperperdincularly to distal border of radial elements, often coalesced and forming carenae;

– medium- and thick-size, simple and, in majority, compound (branching) septal trabeculae; septal faces with pennules and/or menianes and strong, irregular septal perforation (Latomeandridae) and regular ones (Microsolenidae).

Some remarks on the more typical microstructural type of skeleton mentioned above are given below.

Amphiastreidae Ogilvie (suborder Pachythecaliina) is the only family with minitrabecular septal microstructure studied here. In the studied fauna it is represented by three species, two from the genus *Amphiaulastrea* and one new species from the genus *Mitrodendron*. Unfortunately they are not well preserved. But the type of the microstructure of this coral group is visible in exceptionally well preserved *Amphiaulastrea rarauensis* (Morycowa) (Morycowa, 1971, pl. 26, fig. 1c, d; Kołodziej, 1995, fig. 4H and herein in Fig. 9A–D). Its septa are built by simple trabeculae (in transverse thin section ca 3–4 calcification centres per 100 µm; Fig. 9D). In some septa trabecular calcification centres most commonly coalesce and form one median continuous line in mid-septal zone (Fig. 9A, D). Lateral facies of septa are almost smooth or with very fine granulations.

The wall is of particular interest in this coral group. It is interpreted as pachytheca similar to those known in some Triassic scleractinians (see Roniewicz & Stolarski, 1999, 2001). On account of this type of wall structure, these authors placed the family Amphiastreidae Ogilvie in the suborder Pachythecaliina Eliášová. The walls of amphiastreid Cretaceous corals, as, for example, well preserved and illustrated *Amphiaulastrea* from the Aptian of Romanian Carpathians (Morycowa, 1971; Kołodziej, 1995) show distinct analogies; however, they do not seem to be entirely

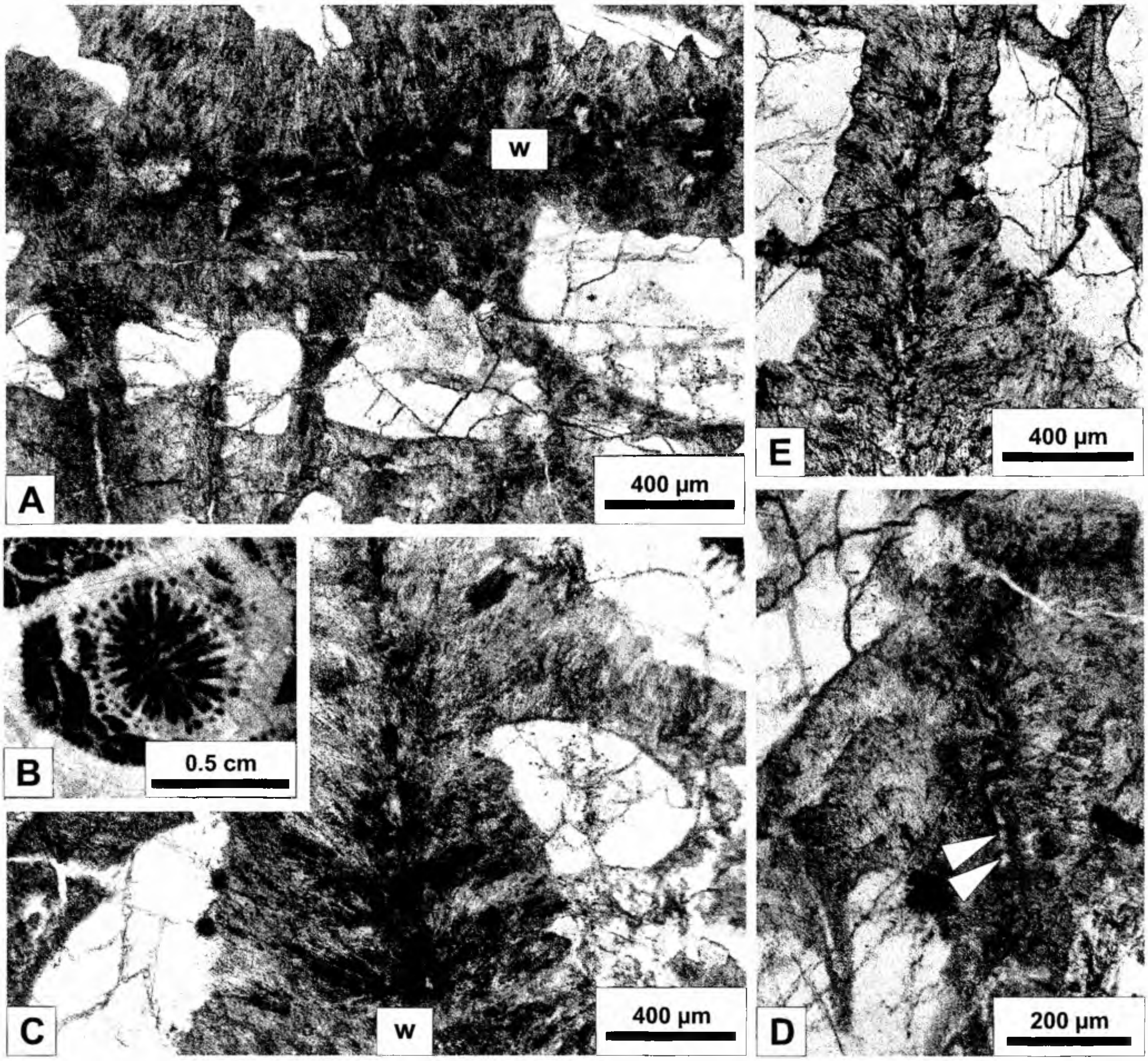

Fig. 9. **A–D.** *Amphiaulastrea rarauensis* (Morycowa), holotype: UJ 124 P 120, Romanian Carpathians (Rarau area), presented by Morycowa (1971, pl. 26, figs 1a-f). A – the wall (w) common to neighbouring corallites, built from lateral, long, subhorizontal trabeculae extend from, on both sides, distinct calcification centres; B – transverse section of corallite; C – longitudinal section of the wall (w); lateral trabeculae occurring on both sides of main trabeculae; D – transverse section (thin section: UJ 124P 120a) showing distinct calcification centers (at right, arrows) arranged in mid-septal zone and, at right, some lateral (secondary) trabeculae; in short septum (at left) continuous mid-septal line formed by coalesced calcification centres is marked; **E.** *Preverastraea isseli* (Prever), specimen: UJ 158P 90, presented in Fig. 15A–C. Longitudinal section of the wall, common to neighbouring corallites showing lateral trabeculae occurring on both sides of main trabeculae

identical with the walls of typical Triassic pachythecaliine corals (Zardinophyllidae). The corallite wall of cerioid *Amphiaulastrea*, common to neighbouring corallites is built from lateral, long, subhorizontal trabeculae (Fig. 9A, C), extending on both sides, from the distinct large calcification centres well visible in transverse thin sections (Fig. 9A). Such well developed calcification centres and trabecular structures are not obseved in the wall of adult Triassic pachythecaliines. Some similar structure can be only seen in the wall of Triassic pachythecaliine corals *Quenstedtiphyllia fritschi* (Volz), between the parental and daughter corallite during (pocked-budding) Taschenknospung (Roniewicz & Stolarski, 2001, fig. 3: 2).

With reference to the pachythecaliine wall (Roniewicz & Stolarski, 1999, 2001, see also Cuif, 1975), it should be noted that the wall of some rhipidogyrines show some similarity to amphiastreid wall (considered as pachytheca) (Fig. 9E). In rhipidogyrine corals the trabeculae are horizontally oriented and the septa are in structural continuation with the wall (see Roniewicz & Stolarski, 1999, p. 143).

In the described assemblage two genera represent the family **Heterocoeniidae** Oppenheim (suborder Heterocoeniina M. Beauvais), *Heterocoenia* Milne Edwards & Haime and *Latusastraeopis* Morycowa & Marcopoulou-Diacantoni (Fig. 10F, G). This family is still the object of studies and discussions concerning its microstructure and affiliation with amphiastreine corals. Milne Edwards & Haime (1848) placed *Heterocoenia* genus near *Amphiastrea*. Some later researchers shared this opinion. M. Beauvais (1977) creating suborder Heterocoeniina, pointed to microstructural similarity of the corals of this suborder to the amphiastreine corals. Recently Kołodziej (1995) included suborder Heterocoeniina at the familial level in the Amphiastreina on account of "similar skeletal microstructure" and traces of "Taschenknospung budding" in *Thecidiosmilia morycowae* (probably heterocoenid coral). I retain suborder Heterocoeniina because of the lack of definite proof concerning budding by "Taschenknospung" (pocket-budding) in the type specimens as well as on account of slightly thicker septal trabecular diameters (60–120 μm) and stronger septal ornamentation.

The microstructure of the representatives of the family **Stylinidae** d'Orbigny (suborder Stylinina Alloiteau), *Heliocoenia triradiata* Morycowa and *Enallhelia* sp. is not preserved, but the microstructure of *Heliocoenia* is generally known (Morycowa, 1971; Morycowa & Masse, 1998, fig. 2). The costosepta are composed of simple and irregular branching trabeculae, disposed in a divergent system. For example, in *Heliocoenia carpathica* diameters of costoseptal trabeculae oscillate between 50 and 160 μm (Morycowa, 1971). Presence of septal auriculae (Gill, 1977) (Figs 8C, 11H, I) is one of diagnostic feature of the disscused taxa above.

The second microstructurally distinct group, very richly represented among the coral fauna from Agrostylia, are those from the **Aulastraeoporidae** Alloiteau (suborder Rhipidogyrina). They have a special type of microstructure (neorhipidacanth trabeculae – Roniewicz, 1976). The septa are built, according to that author, by regular branching trabeculae, equal in diameter, small and medium in size. In the material of Agrostylia the trabeculae are slightly larger in diameters, they are medium- to thick, commonly from about 80 to 250 μm (Figs 14E, 15C, 16C; Morycowa & Marcopoulou-Diacantoni, 1997; Morycowa & Kołodziej, 2001). The septa are in structural continuation with the wall (this wall is named here rhipidotheca; see: family Aulastraeoporidae). The internal surfaces of walls and lateral surfaces of septa are covered with rich, sharp granulations formed by the tips of lateral trabeculae (Fig. 16B). Prominent trabecular expansions occur frequently in more internal lateral parts of septa. In some representatives of this coral group, lonsdaleoid septa and septal auriculae can be observed.

The thick trabecular structure of septa is characteristic of *Actinastrea* and described here new genus *Agrostyliastraea* (the family **Actinastreidae** Alloiteau, suborder Archaeocoeniina). The microstructure of *Actinastrea* is well known and illustrated by many authors (Felix, 1903, figs 56, 58; Alloiteau, 1954, fig. 2, 1957, figs 4, 5; Morycowa, 1971, text-fig. 11, pl. 2, fig. 1a-c; M. Beauvais, 1982, vol. 5, figs 1, 2a, b). The thick or medium-size, simple, and in places branching trabeculae having commonly diameters about 70 to 200 μm (Fig. 20C) are arranged subhorizontaly in series.The tips of the long bundles of fibres or the tips of lateral trabeculae form on the lateral septal surface spiniform, prominent granules. A similar septal microstructure is observed in *Agrostyliastraea* n.gen. (Figs 22B, C; 23C), but the orientation of septal trabeculae is generally at more acute angle.

The microstructure of the **Faviidae** Gregory (suborder Astraeoina) is differentiated in trabecular diameter and structure, both in fossil and recent representatives (Chevalier, 1961, 1971). The skeletons of these coral groups are characterized by simple and also by branching (mono- and polycentric) trabeculae. The diameters of trabeculae in the radial elements of the colony ?*Favia cretacea* n.sp. oscillate between 80 and 500, rarely reaching 600 μm (Figs 8G, 25A, B). In *Favia*, trabeculae with varying diameters coexist frequently in the septa of the same corallite (Chevalier, 1971, text-figs 93, 95, 100). In the genus *Eugyra*, the diameters of trabeculae are considerably smaller, they range from about 35 to 150 μm (Morycowa, 1997).

The family **Montlivaltiidae** Dietrich (suborder Astraeoina) is characterized by simple and branching trabeculae, commonly medium to thick. In *Clausastrea magna* Reig Oriol, the density of trabecular centres in transverse section of radial elements is ca 3–4 per 1 mm. In the Montlivaltiidae from the Romanian Carpathians (Morycowa, 1971) the diameters of trabeculae are between 80 and 500 μm, depending on the genera (*Dimorphocoenia*, *Clausastrea*, *Montlivaltia*) and on their place in radial elements. Lateral surfaces of radial elements are granulated, mainly with granulations ranged subperpendicularly to the distal septal edge, frequently coalesced and forming carenae (see Alloiteau, 1957; Morycowa, 1964; Gill, 1970; Morycowa *et al.*, 2001).

The family **Placocoeniidae** Alloiteau (suborder Astraeoina) is here represented by three species, two from the genus *Columnocoenia* Alloiteau (*C. ksiazkiewiczi* Morycowa and *C. bucovinensis* Morycowa) and one from *Neocoenia* (*N. subpolygonalis*). The costosepta of *Columnocoenia* are built of medium- and thick-size, mainly divergent trabeculae (Morycowa, 1964, pl. 18, fig. 1b, c; Morycowa, 1971, text-fig. 30A, B; Morycowa & Masse, 1998, text-fig. 2F) (Fig. 8F). This type of trabeculae can also be seen in the figure presented by Ogilvie for *Galaxea* (Ogilvie, 1897, pl. 7, fig. 3) and by Chevalier (1971, fig. 173C) in the illustration of the septal palus of *Montastraea*. The septal microstructure of *Neocoenia* seem to be similar to that known in *Columnocoenia*.

Among the corals studied, there is a richly represented (in taxa, not in specimens) the family **Latomeandridae** Alloiteau (suborder Microsolenina) with specimens having medium- to thick sized, polycentric trabeculae, septa bearing pennules or/and menianes (Figs 8H; 34C, D; 36B, D, E) and irregularly porous radial elements. This group is represented in the studied material by 8 species (of which two are determined at the generic level) from 6 genera, such as: *Latomeandra*, *Latiastrea*, *Ovalastrea*, *Latohelia*, *Mixastraea* and *Stylomeandra*.

SYSTEMATIC PALAEONTOLOGY

Alloiteau's systematic (1952, 1957), is generally accepted, with modifications, supplements and emendations introduced by some authors, i.a.: M. Bauvais (1977), Chevalier (1987), Eliášová (1976), Roniewicz (1976) and Morycowa & Roniewicz (1995, 1990), Roniewicz & Stolarski (2001).

List of Albian corals from Agrostylia

Taxa described or only illustrated in Morycowa & Marcopoulou-Diacantoni (1997) and in Morycowa & Kołodziej (2001) are in bold type.

Class ANTHOZOA Ehrenberg 1834

Subclass ZOANTHARIA Blainville 1830
Order SCLERACTINIA Bourne 1900

Suborder PACHYTHECALIINA Eliášová 1976
Family AMPHIASTREIDAE Ogilvie 1897
Genus *Amphiaulastrea* Geyer 1955
Amphiaulastrea suprema Morycowa et Marcopoulou-Diacantoni 1997
Amphiaulastrea minima (Prever 1909)
Genus Mitrodendron Quenstedt 1881
Mitrodendron parnassus Morycowa n.sp.

Suborder HETEROCOENIINA M. Beauvais 1977
Family HETEROCOENIIDAE Oppenheim 1930
Genus *Heterocoenia* Milne Edwards et Haime 1848
Heterocoenia minuta Morycowa nom. nov.
Genus Latusastraeopsis Morycowa et Marcopoulou-Diacantoni 1997
Latusastraeopsis mitzopoulosi Morycowa et Marcopoulou-Diacantoni 1997

Suborder STYLININA Alloiteau 1952
Family STYLINIDAE d'Orbigny 1851
Genus *Heliocoenia* Etallon 1859
Heliocoenia triradiata Morycowa 1971
Genus *Enalhelia* Milne Edwards et Haime 1849
Enallhelia sp.
Family AGATHELIIDAE L. et M.Beauvais 1975
Genus *Agathelia* Reuss 1854
Agathelia minor Reig Oriol 1997

Suborder RHIPIDOGYRINA Roniewicz 1976
Family AULASTRAEOPORIDAE Alloiteau 1957
Genus *Aulastraeopora* PREVER 1909
Aulastraeopora aff. *deangelisi* PREVER 1909
Aulastraeopora graeca Morycowa n.sp.
Genus *Preverastraea* Beauvais 1976
Preverastraea felixi (Hackemesser 1936)
Preverastraea diplothecata (Hackemesser 1936)
Preverastraea isseli (Prever 1909)
Preverastraea marinosi Marcopoulou-Diacantoni et Morycowa n.sp.
Preverastraea robusta Morycowa n.sp.
Preverastraea sp.
Genus *Apoplacophyllia* Morycowa n.gen.
Apoplacophyllia hackemesseri Morycowa n.sp.
Family RHIPIDOGYRIDAE Koby 1905
Genus *Paraacanthogyra* Morycowa et Marcopoulou-Diacantoni 1997
Paraacanthogyra parnassensis Morycowa et Marcopoulou-Diacantoni 1997

Suborder MEANDRIINA Alloiteau 1952
Family MEANDRINIDAE Gray 1847
Genus *Parnassomeandra* Morycowa n.gen.
Parnassomeandra diacantoniae Morycowa n.sp.
Genus *Meandroria* Alloiteau 1957
Meandroria sp.

Suborder ARCHEOCOENIINA Alloiteau 1952
Family ACTINASTREIDAE Alloiteau 1952
Genus *Actinastrea* d'Orbigny 1849
Actinastrea aequibernensis (Hackemesser 1936)
Actinastrea major Morycowa 1971
Genus *Agrostyliastraea* Morycowa n.gen.
Agrostyliastraea irregularis Morycowa n.sp.

Suborder ASTRAEOINA Alloiteau 1952
Family FAVIIDAE Gregory 1900
Genus ?*Favia* Oken 1815
?*Favia cretacea* Morycowa n.sp.
Genus *Plesiofavia* Alloiteau 1957
Plesiofavia dubia (de Fromentel 1884)
Genus *Myriophyllia* d'Orbigny 1849
Myriophyllia propria Sikharulidze 1979
Genus *Eugyra* de Fromentel 1857
Eugyra aff. *arasensis* Alloiteau 1947
Genus *Diplogyra* Eguchi 1998
Diplogyra minima Morycowa et Marcopoulou-Diacantoni 1997
Genus *Eohydnophora* Eguchi 1936
Eohydnophora aff. *crassa* (de Fromentel 1862)
Family MONTLIVALTIIDAE Dietrich 1926
Genus *Clausastrea* d'Orbigny 1849
Clausastrea magna Reig Oriol 1997
Genus *Peplosmilia* Milne Edwards et Haime 1850
Peplosmilia fromenteli Angelis d'Ossat 1905
Family ISASTREIDAE Alloiteau 1952
Genus *Tricassastraea* Alloiteau 1966
Tricassastraea* cf. *parnassensis Alloiteau 1966
Family PLACOCOENIIDAE Alloiteau 1952
Genus *Columnocoenia* Alloiteau 1951
Columnocoenia ksiazkiewiczi Morycowa 1964
Columnocoenia bucovinensis Morycowa 1971
Genus *Neocoenia* Hackemesser 1936
Neocoenia subpolygonalis Hackemesser 1936
Family DERMOSMILIIDAE Koby 1889
Genus *Calamophylliopsis* Alloiteau 1952
Calamophylliopsis fotisaltensis (Bendukidze 1961)
Calamophylliopsis sp.
Genus *Pleurocora* Milne Edwards et Haime 1849
Pleurocora aff. *alternans* Milne Edwards et Haime 1848

Suborder MICROSOLENINA Morycowa et Roniewicz 1995
Family LATOMEANDRIDAE de Fromentel 1861
Genus *Latomeandra* Milne Edwards et Haime 1848
Latomeandra minor Reig Oriol 1975
Genus *Ovalastrea* d'Orbigny 1849
Ovalastrea baumbergeri (Koby 1897)
Genus *Latohelia* Löser 1987
Latohelia reptans (Počta 1897)
Genus *Latiastrea* Beauvais 1964

Latiastrea paronai (Prever 1909)
Latiastrea mucronata Sikharulidze 1979
Genus *Mixastraea* Roniewicz 1976
Mixastraea westfalica Löser 1993
Mixastraea polyseptata Morycowa n.sp.
Genus *Stylomaeandra* de Fromentel 1867
Stylomaeandra sp.
Family Microsolenidae KOBY 1890
Genus *Hydnophoromeandraraea* Morycowa 1971
Hydnophoromeandraraea volzi Morycowa 1971

Subclass OCTOCORALLIA Haeckel 1866
Order COENOTHECALIA Bourne 1900
Family HELIOPORIDAE Moseley 1876
Genus *Pseudopolytremacis* Morycowa 1971
Pseudopolytremacis cf. *spinoseptata* Morycowa 1971

Abbreviations used in the descriptions

D – corallum diameter (two perpendicular diameters; in mm);
H – height of corallum (maximum; in mm);
d cor – corallite diameter;
d cal – calice diameter;
d l – corallite lumen diameter;
c-c – distance between centres of corallites;
c-c series – distance between centres of corallites of the same series;
c-c adj – distance between centers of corallites of adjacent series;
l col – length of collines;
col-col – distances between collines of adjacent corallite series;
th S – thickness of septa;
th w – thickness of wall;
w ser – width of corallite series (width between the walls);
S – number of septa in the corallite;
C – number of costae in the corallite;
CS – number of costosepta in the corallite;
S1, S2-n – septa (radial elements) of succeesive size orders (which may or may not correspond to cycles);
rad el – radial elements;
den s/mm – density of septa per mm (measured in the wall zone or in the outer zone of corallites);
den c/mm – density of costae per mm;
den gr – density of granules measured along the septal edge, in transverse section;
den end/mm – density of endothecal elements (longitudinal section) per mm;
den ex/mm – density of exothecal elements (longitudinal section) per mm;
den cc – density of trabecular calcification centres;
d tr – diameter of trabeculae measured along the septal plate, in transverse section;
c-c tr – distance between trabecula centres (in transverse section, in mm or μm);
den tr/μm – density of trabeculae (per μm or mm, measured along the septal plate, in transverse section);
den pen (long. sec.)/mm – density of pennulae per mm in longitudinal section;
den pen (transv. sec.)/mm – density of pennulae per mm in transverse section;
(...) – less frequent values are presented in brackets;
((...)) – sporadic values.

The numbers of specimens (and of thin sections) follow the order in which they were collected.

The year of publication in the synonymy lists is in italics if the species is mentioned but not described or illustrated.

Class ANTHOZOA Ehrenberg 1834
Subclass ZOANTHARIA Blainville 1830
Order SCLERACTINIA Bourne 1900
Suborder PACHYTHECALIINA Eliášová 1976, emend. Roniewicz et Stolarski 2001

Family AMPHIASTREIDAE Ogilvie 1897

The problems concerning the microstructure of the amphiastreine corals were discussed in many publications (i.a. Alloiteau, 1957; L. Beauvais, 1970, 1974, 1976; Eliášová, 1975, 1976, 1978; Melnikova & Roniewicz, 1976; Kołodziej, 1995) and recently by Roniewicz & Stolarski (2001) and Stolarski & Russo (2001).

Eliášová (1976, 1978) included the suborder Amphiastraeina Alloiteau 1952 together with two new, created by her, suborders Pachythecaliina Eliášová 1976 and Carolastraeina Eliášová 1976 and with Heterocoeniina L. Beauvais 1977 into the order Hexanthiniaria Montanaro Gallitelli 1975.

Roniewicz & Stolarski (2001: p. 43) placed the family Amphiastraeidae Ogilvie 1897 in the suborder Pachythecaliina Eliášová 1976. A short emended diagnosis of this suborder presented by them, is "Corals with pachytheca", and the emended diagnosis of the family Amphiastreidae: "Pachythecaliines with Taschenknospung type of asexual increase. Separated septal calcification centers". Their diagnosis concerning the subfamily Amphiastreinae Ogilvie 1897 is: "Amphiastreids with two-zonal endotheca. Corallites with bilateral symmetry in the adult stage". The diagnosis of the subfamily Amphiastreinae should be completed by adding more exact information about the symmetry of the radial apparatus. The diagnosis should read: "Amphiastraeids with two-zonal endotheca. Corallites with bilateral or quasi-radial symmetry in the adult stage", because some Cretaceous Amphiastreinae have septa arranged in nearly radial symmetry (see Fig. 10D).

According to Stolarski & Russo (2001), beside of the Triassic Zardinophyllidae Montanaro Gallitelli and Triassic–Cretaceous Amphiastraeidae Ogilvie, of already established position among the pachythecaliines *sensu stricto*, the other families, traditionally classified with amphiastraeids, in the suborder Amphiastreina (as Carolastraeidae, Donacosmiliidae, Intersmiliidae) as well as the family Heterocoeniidae (included by Kołodziej, 1995 into Amphiastreina) are considered by these authors as pachythecaliines *sensu lato*.

The suggestions presented in Stolarski & Russo (2001) concerning pachythecaliines *s.l.*, require evidences basings on new, better preservation specimens, and re-descriptions of hitherto known taxa.

Genus *Amphiaulastrea* Geyer 1955
Type species: *Aulastraea conferta* Ogilvie 1897

Amphiaulastrea suprema Morycowa et Marcopoulou-Diacantoni 1997
Fig. 10A

1997. *Amphiaulastraea suprema* Morycowa et Marcopoulou-Diacantoni: p. 254-255, text-figs 4a, b, pl.1, figs 1-4.

Material: 3 colony: UJ 158P: 1, 2/1, 2/2; 6 thin sections: UJ 158P: 1a, 2/1a-c, 2/2a, b.
Dimensions (in mm):

	A. suprema Mor. & Marc.-Diac. 1997	*A. guiscardii* Prever 1909
d cor	3-6.5(7)	3-4.5
d cal	2.5-3.5	2-4
S	24 (S1-S3) + n S4	24

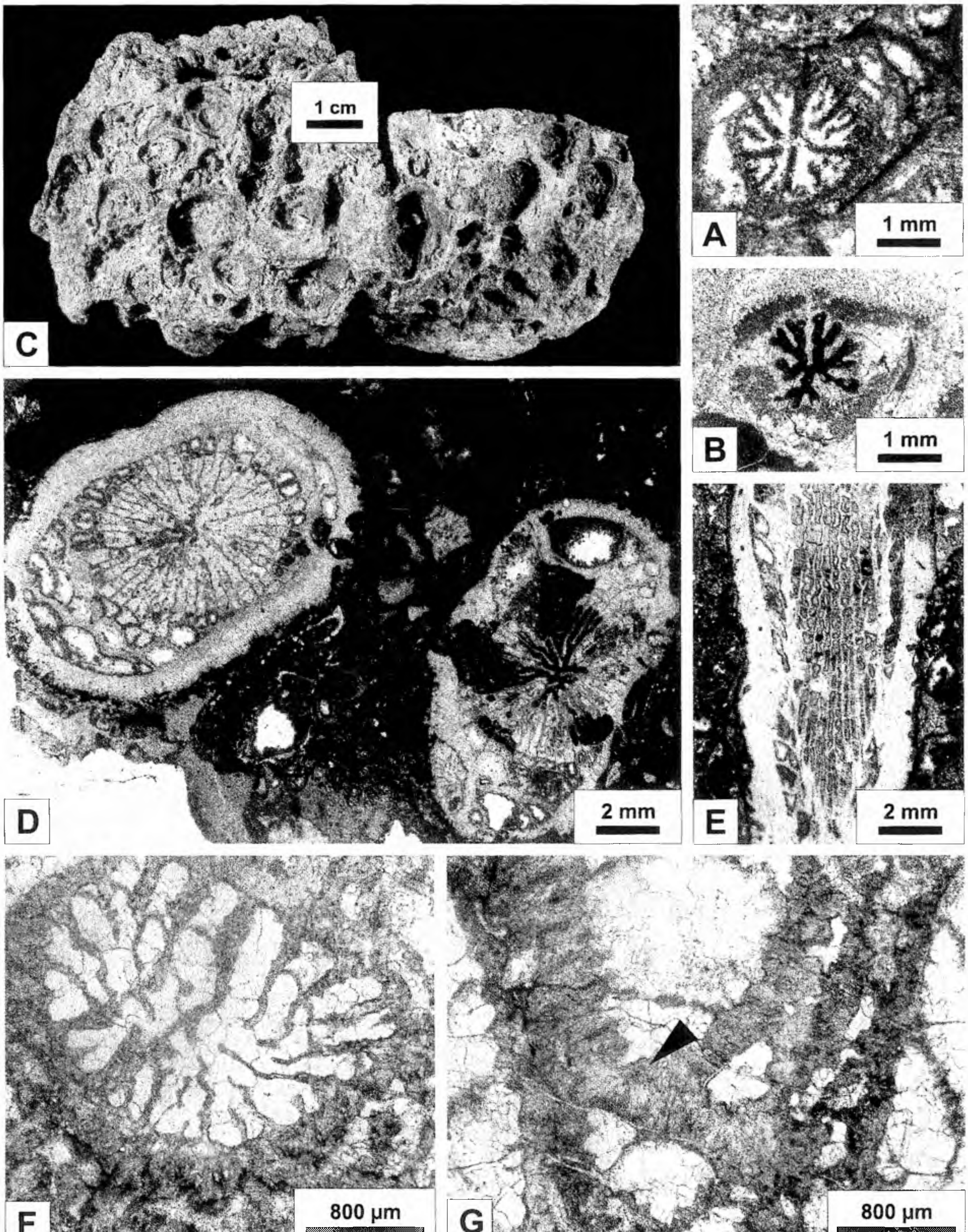

Fig. 10. **A.** *Amphiaulastrea suprema* Morycowa & Marcopoulou-Diacantoni, holotype: UJ 158P 2/1. Transverse section (thin section UJ 158P 2/1a) of corallite showing nearly radial symmetry in arrangement of septa (fragment from the pl.1, figs 1 and 2, presented in Morycowa & Marcopoulou-Diacantoni, 1997); **B.** *Amphiaulastrea minima* (Prever), corallite in transverse section with well marked bilateral symmetry in arrangement of septa (thin section: UJ 158P); **C–E.** *Mitrodendron parnassus* Morycowa n.sp., holotyp (UJ 158P 4): C – calicular surface of subphaceloid colony; D – transverse section of corallites showing very thin septa arranged in quasi-radial symmetry (thin section: UJ 158P 4a); E – Corallite in londitudinal section showing arrangement of endothecal elements (thin section – UJ 158P 4b); **F, G.** *Latusastraeopsis mitzopoulosi* Morycowa & Marcopoulou-Diacantoni: F – corallite in transverse section presenting well developed septa disposed in bilateral symmetry (thin section: UJ 158P 8a); G – enlarged fragment of longitudinal section presented in Morycowa & Marcopoulou-Diacantoni (1997, pl. 2, fig. 1), showing exothecal dissepiments and trabecular lamellae (arrow) (thin section:UJ 158P 8b)

Remarks: *Amphiaulastrea suprema* is very similar to *Amphiaulastrea guiscardii* (Prever) (former name of genus *Amphiastrea*) from the Albian in Monti d'Ocre, Italy (Prever, 1909). In the two species discussed (after Prever's description and drawing in text-fig. 29) bilateral symmetry is only slightly marked and the septa of the first cycle are considerably thicker than others and almost reach the centre. However, *A. suprema* differs from *A. guiscardii* in slightly larger diameter of corallites and in the development, in the adult corallites, of 24 septa (S1–S3 cycles) and incomplete S4 ones. A precise comparison of the discussed species is not possible, as Prever's photograph of *Amphiaulastrea guiscardii* (Prever, 1909, pl. 7, fig. 1) is of poor quality.

A. suprema is similar to *A. guiscardii* from Aptian of Livadia, Greece (Abdel-Gawad & Gameil, 1995), but it has slightly larger corallite diameters and more septa. It differs from *A. aliensis* Sikharulidze described by Sikharulidze (1977) from the Lower Barremian in Georgia and from the *A. keuppi* Baron-Szabo (Baron-Szabo & Steuber, 1996) from the Aptian in Parnassos region (near Delfi-Arachova) in the arrangement of septa, from the latter also in slightly smaller diameters of corallites.

Amphiaulastrea minima (Prever 1909)
Fig. 10B

1909. *Amphiastraea minima* Prever: p. 136, text-fig. 31.
?1996. *Amphiastraea minima* Prever: Baron-Szabo & Steuber, p. 21, pl. 11, fig. 4.

Material: 1 fragment of colony: UJ 158P 3; 1 thin section: UJ 158P 3a.

Dimensions (in mm):

	UJ 158P 3	*A. minima* (Prever); (Prever, 1909)
D	30×50	
H	ca 30	
d cor	2.5-4	4-5
d cal	1.2-2.5	2.5-3
S	12-24	24-26

Remarks: The specimen from Agrostylia differs from Prever's specimen in smaller diameter of the corallites and in slightly more marked bilateral symmetry due to one septum longer than the other five S1, and one shorter septum S1 opposite this longer one.

A. minima presented by Baron-Szabo (Baron-Szabo & Steuber, 1996) from Greece differs from the Italian specimen in subradial symmetry in the arrangement of septa. *A. minima* resembles *A. gracilis* Koby var. *coespitosa* Angelis d'Ossat from the Cretaceous of Capri (Angelis d'Ossat, 1905b). However, the latter has slightly larger corallite diameter and mainly 16 septa (two size orders).

Distribution:
Albian – Italy, Monte d'Ocre in Abruzzi
?Aptian – Greece, Parnassos region (near Delfi-Arachova)

Genus *Mitrodendron* Quenstedt 1881
Type species: *Lithodendron mitratum* Quenstedt 1881

Mitrodendron parnassus Morycowa new species
Fig. 10 (C–E)

Holotype: UJ 158P 4, Fig. 10 (C–E).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia, Parnassos region in Central Greece.
Etymology: *parnassus* – named after the Parnassos region where the specimen comes from.
Diagnosis: Corallites elliptic in transverse section, with subcircular calices. The longer diameters of corallites, from 8 to 12 mm and the shorter from 5 to 8 mm. Diameters of calices – 4–6 mm. Fourty eight thin septa (four cycles) arranged in three or four size orders. Sporadically, a few septa of the fifth cycle occur. Bilateral symmetry marked only by one slightly longer septum – S1. Dissepimental marginarium irregular and incompletely developed; density of axial endothecal tabuloid elements – 10–12 per 5 mm and of peripherial vesicular ones – 5–7/5 mm.
Material: 1 colony: UJ 158P 4; 3 thin sections: UJ 158P 4a-c.
Dimensions (in mm):

D	60×115
H	ca 40
d cal	4-6×5-6 (6×6; 5×6; 4×5)
d cor longer	8-12 (8×12; 6×11,5; 5×8)
d cor shorter	5-8
c-c	13-15
S	to 48 (6S1 + 6S2 + 12S3 + 24S4) + n S5
den end (axial zone	10-12/5
den end (peripheric zone)	5-7/5

Description: Phaceloid corallum with oval corallites and subcircular calices. Adult forms have four cycles of thin septa, arranged in three or four size orders. The first two cycles of septa (S1 and S2) are subequal in length. Their internal ends are a little thickened. Bilateral symmetry marked only by one slightly longer S1 septum. The S3 septa are slightly shorter and thinner in their internal ends, the S4 septa are about 1/2 the length of S1. In places very short S5 occur. Endotheca formed by subvertically inclined vesicular dissepiments in the outer zone of corallites and tabuloid ones in their central zone. Budding by "Taschenknospung". The skeleton microstructure is not preserved.
Remarks: *Mitrodendron parnassus* n.sp. differs from other species of the genus *Mitrodendron* in less marked bilateral symmetry of septa. On account of this symmetry, the Greek specimen resembles *Donacosmilia*. However, due to other features, e.g. the development of dissepimental marginarium, it has been placed in the genus *Mitrodendron*.

The genus *Mitrodendron* is one of the relics of the Upper Jurassic European taxa.

Alloiteau first described a Cretaceous species of this genus (*M. cretacea* All.; Alloiteau, 1946–1947, p. 238–239, pl. 3, figs 11, 12) from the Upper Aptian in Spain. A small colony of *Mitrodendron* (*Mitrodendron* sp.) also has been described by Morycowa & Masse (1998) from the Lower Cretaceous of Provence (France). Our species differs from that described from the Aptian of Spain mainly in the absence of clear bilateral symmetry, and from the Provencale specimen in having larger corallites and more septa.

The Greek specimen is similar in corallite size to Jurassic *M. ogilviae* Geyer (Geyer, 1955) and *M. biennensis* Beauvais (Beauvais & Bernier, 1981), but differs from them in having more septa and lacking a clear bilateral symmetry.

The phaceloid colony from the Albian of Cantabria Province, North-Spain, identified by Baron-Szabo (Baron-Szabo & Fernandez-Mendiola, 1997) as ?*Cheilosmilia rugosa* (Koby) can also represent yet another species of the genus *Mitrodendron*. *Cheilosmilia* is not a phaceloid but solitary coral.

Suborder HETEROCOENIINA M. Beauvais 1977
Family HETEROCOENIIDAE Oppenheim 1930

Kołodziej (1995) included suborder Heterocoeniina at the superfamilial level (Heterocoeniidea) into the suborder Amphiastraeina Alloiteau. Here, I retain suborder Heterocoeniina on account of some differences in the microstructure of the septa in these two groups (see Morycowa, 1971), as well as lack of definite proof concerning budding by 'Taschenknospung" (pocket-budding), occurring only in the "amphiastraeine" corals.

Genus *Heterocoenia* Milne Edwards et Haime 1848
Type species: *Lithodendron exiguum* Michelin 1847

Heterocoenia minuta Morycowa nom. nov.
(corrected from *H. minima* Morycowa 1971)
Fig. 11 (C–F)

1971. *Heterocoenia minima* Morycowa: p. 66-68, text-fig.19, pl. 12, figs 1, 2.

Material: 1 colony: UJ 158P 20, 1 fragment of colony: UJ 158 5; 3 thin sections:UJ 158P 20a-c.
Dimensions (in mm):

D	45×50
H	ca 30
d cal	0.8-1.2
c-c	1.8-2.5 (3)
S	12 (6S1 + 6S2)
C	12 (+ n S3)

Description: Plocoid colony. Wall of corallites slightly exsert. Six septa S1 reach nearly the center of corallites. Auriculae are observed in their internal edges. In some corallites one S1 septum slightly longer than others (Fig. 11E). Septa S2 shorter than those of S1. Endotheca composed of tabuloid elements and exotheca of large lamellar elements (Fig. 11D).
Remarks: *Heterocoenia minima* described by Morycowa (1971) from the Lower Aptian sediments of the Romanian Carpathians is the younger homonym of *H. minima* d'Orbigny (d'Orbigny, 1850). Both have similar corallite diameters but d'Orbigny species has only 6 radial elements. In order that the Romanian species be valid, I change *H. minima* Morycowa, 1971 into *H. minuta* Morycowa nom. nov.

H. minuta has larger corallite diameters and more numerous septa than *H. minutissima* Reig Oriol from the Santonian of Spain (Reig Oriol, 1997; d: 0.4–0.6 (0.7); S: 6: 3S1 + 3S2).
Distribution:
Early Aptian – Romania, Carpathians (Rarău)

Heterocoenia sp.
Fig. 11 (A, B)

Material: 1 fragment of colony: UJ 158P 19, 1 thin section: UJ 158P 19a.
Dimensions (in mm):

d l	ca 1-1.3
S	1-3 S1 + n S2

Remarks: Poorly preserved fragment of plocoid colony. In transverse thin section only subcircular and elliptic shapes of corallites are visible, with one or three thick septa and some rudimentary ones.

It is possible that *Heterocoenia* sp. represents *H. errecta* (Michelin) know from Senonian (e.g., of France – Corbières en Provence; Alloiteau, 1941) and Gosau facies in Austria (e.g., Reuss, 1854; M. Beauvais, 1977, 1982). However, a more precise identification of this specimen is impossible.

Genus *Latusastraeopsis* Morycowa et Marcopoulou-Diacantoni 1997
Type species: *Latusastraeopsis mitzopoulosi* Morycowa et Marcopoulou-Diacantoni 1997

Latusastraeopsis mitzopoulosi Morycowa et Marcopoulou-Diacantoni 1997
Fig. 10 (F, G)

1997. *Latusastraeopsis mitzopoulosa* Morycowa et Marcopoulou-Diacantoni: p. 255-257, text-figs 5a, b, pl. 1, figs 5-7, pl. 2, figs 1, 2.

Material: 3 specimens: UJ 158P: 8, 21, 22; 6 thin sections: UJ 158P: 8a-c, 21a, 22a, b.
Dimensions (in mm):

Specimens	UJ 158P 8	UJ 158P 21	UJ 158P 22
D	ca 30×70	40×40	26×35
H	ca 20	ca 30	ca 25
d cal long	2.5-3.5		
d cal short	(1.8) 2 (2.2)		
c-c	2.5-4.5 (5)		
S	(28-32) 36 (S1-S3 + n S4)		
den cc (septa)	3-6/200 μm		
d tr (septa, transv. sect.)	ca 40-60 μm		
d tr (perithecal lamellae, transv. sec.)	ca 140--300 μm		

Remarks: Since the first description, two new colonies (UJ 158P 21 and 22) of this species have been added to the collection. The new collected specimens differ from the holotype in having slightly thicker septa.

Suborder STYLININA Alloiteau 1952
Family STYLINIDAE d'Orbigny, 1851

Genus *Heliocoenia* Etallon 1859
Type species: *Heliocoenia variabilis* Etallon 1859

Heliocoenia triradiata Morycowa 1971
Fig. 11 (H, I)

1971. *Heliocoenia triradiata* Morycowa: p. 50-52, text-fig. 15, pl. 6, fig. 1.
?1981. *Heliocoenia triradiata* Morycowa: Eliášová, p. 130.
?1990. *Heliocoenia triradiata* Morycowa: Eliášová, p. 119, pl. 1, fig. 2.

Material: 1 fragment of colony: UJ 158P 23; 2 thin sections: UJ 158P 23a, b.
Dimensions (in mm):

	UJ 158P 23	Holotype: Morycowa, 1971	Eliášová, 1981, 1990
d cal	(0.4) 0.7-1.1	0.7-0.8 (1)	1.1-1.4
c-c	(1.3) 1.5-2	1.5-2 (2.5)	1.5-2.2 (2.7)
S	24 (6S1 + 6S2 + 12S3)	24	24
C	24 (+ n C4)	24 + n C4	

Description: Fragment of massive, plocoid colony. In some corallites triradiary symmetry in the disposition of radial elements can be observed. Young individuals, 0.4 mm in diameter, have 6 septa and 12 costae. In adult forms there are 24 costosepta, rarely in

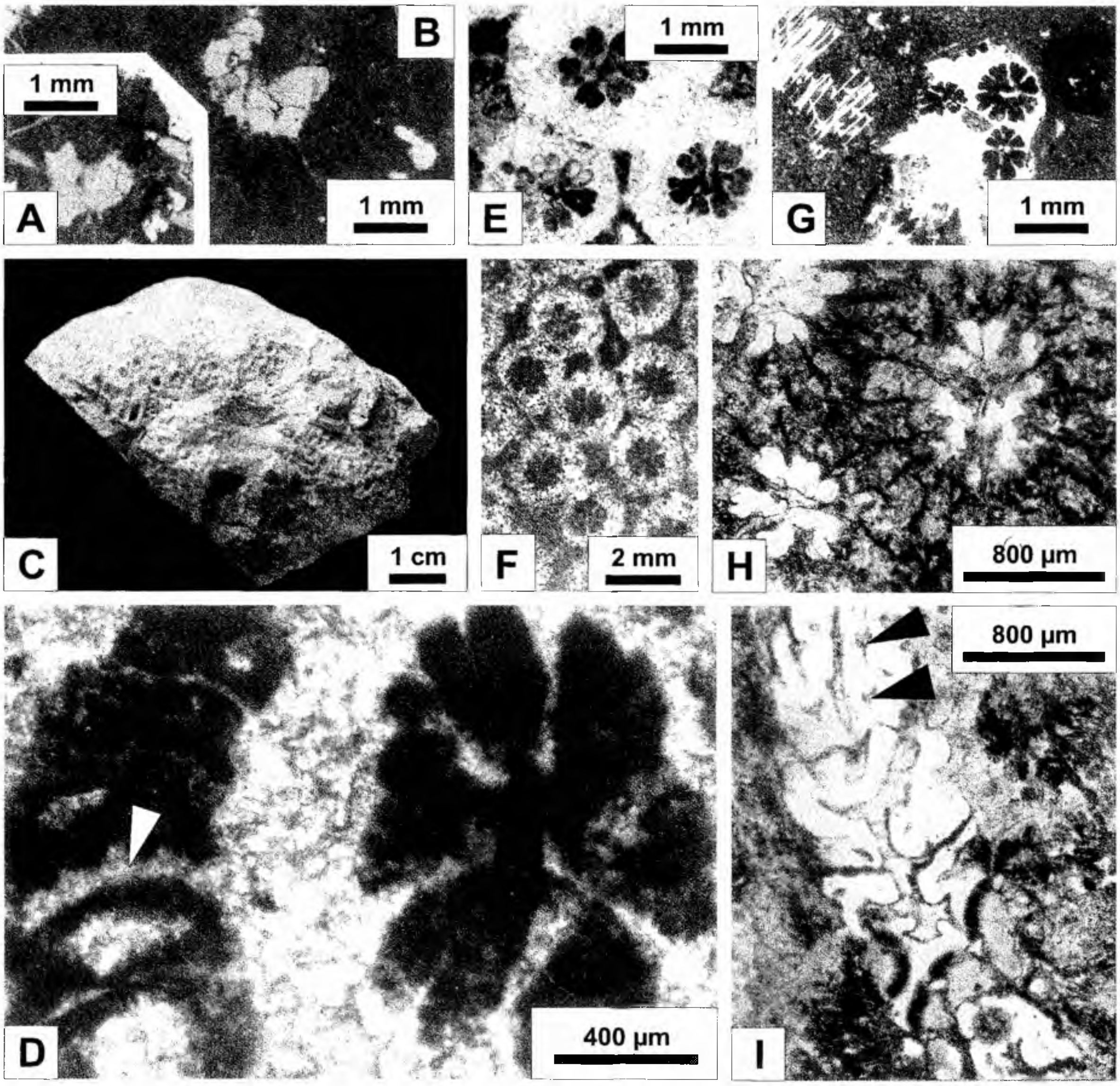

Fig. 11. **A, B.** *Heterocoenia* sp., two poorly preserved corallites in transverse section showing characteristic bilateral (at right) and triradial (at left) symmetries in arrangement of septa (thin section: UJ 158P 19a); **C–F.** *Heterocoenia minuta* Morycowa nom. nov.: C – fragment of calicular surface (specimen: UJ 158P 20); D – transverse, slightly oblique section of corallite exothecal elements, with trabecular lamella showed by arrow (thin section: UJ 158P 20b); E – corallite in transverse section showing bilateral symmetry in arrangement of septa (thin section: UJ 158P 20a); F – enlarged calicular surface of the specimen presented in C; **G.** *Enallhelia* sp., transverse section (thin section: UJ 158P 24a); **H, I.** *Heliocoenia triradiata* Morycowa: H – transverse section (thin section: UJ 158P 23a), I – Longitudinal section of corallite showing (arrows) sections of auriculae (thin section: UJ 158P 23b)

some corallite a few costae of the fourth cycle also occur. Auriculae, mainly in the septa S1 and S2, well developed. Columella small, lamellar.

Remarks: *Heliocoenia triradiata* described by Eliášová (1981, 1990) shows larger diameters of corallites than the holotype.

Distribution:

?Late Tithonian – Czech Republic, Štramberk
?Tithonian–Berriasian – Czech Republic, Pavlovské Vrchy
Early Aptian – Romania, Carpathians (Rarau)

Genus *Enallhelia* Milne Edwards et Haime 1849
Type species: *Lithodendron compressum* Goldfuss 1829

Enallhelia sp.
Fig. 11G

Material: 1 fragment of colony: UJ 158P 24, 1 thin section: UJ 158P 24a.

Dimensions (in mm):

d l	0.7×0.7; 0.5×0.7; 0.4×0.6
S	8S1 + 8S2 + n S3

Remarks: Small fragment of a branching colony with a few corallites. The adult individual is round in transverse section (d: 0.7 mm), with costosepta arranged in octomeral symmetry. Columella styliform, small, elliptic in cross section.

Because of octomeral symmetry of radial elements, the species described here is similar to the Late Jurassic *Enallhelia tubulosa* Becker (Becker, 1875) but differs in considerably smaller diameters of corallites (in *E. tuberosa*: d: ca 2 mm).

Family AGATHELIIDAE L. et M. Beauvais 1975

Genus *Agathelia* Reuss 1854
Type species: *Agathelia asperella* Reuss 1854

Agathelia minor Reig Oriol 1997
Fig. 12 (D–F)

1997. *Agathelia minor* Reig Oriol: p.18-19, pl. 2, figs 3, 4.

Material: 1 fragment of colony: UJ 158P 25; 2 thin sections: UJ 158P 25a, b.

Dimensions (in mm):

d l	3-4 (4.5)
c-c	(3.5) 4-8
S	24-ca 48 (6S1 + 6S2 +12S3 + nS4)
den cc	ca 6/400 μm

Description: Fragment of massive, plocoid colony with circular or slightly elliptic calices. Costosepta compact, very thin, arranged in three or four (the latter often incomplete) cycles and 6 systems. Septa of the two first cycles are subequal in length, but S1 septa are slightly thicker. The septa of the first two cycles extend to the columella. Costae very short and thicker than septa. Parathecal wall. Columella small, thin-lamellar. Endotheca consists of vesicular dissepiments and subhorizontal trabecular lamellae. Budding intercalicinal.

Microstructure: In the transverse section of radial elements, the vestiges of simple, medium-sized trabeculae can be observed.

Remarks: The species is related to *A. asperella* Reuss (Reuss, 1854), common in Upper Cretaceous rocks (mainly in Gosau Basin). *Agathelia minor* differs from *A. asperella* in smaller corallite diameters.

Alloiteau (1941) described *A. ransoni* as a new species from the Cenomanian of Sarthe (France). If this specimen represents *Agathelia*, then our species differs from it in larger corallite diameters. The calice diameters of Alloiteau's specimen are 0.8–1.5 mm and the septa are arranged in 6 systems.

From *A. urgonica* described by Dietrich (1926) from the Lower Cretaceous (Barremian–Aptian) of Tanzania, the Greek species differs in considerably smaller diameters of corallites (d in *A. urgonica*: 5–10 mm) and in the radial elements arranged in 6 and not 10 systems.

Distribution:
Campanian – North-East Spain, Prepyrenees of Lérida Province

Suborder RHIPIDOGYRINA Roniewicz 1976
Family AULASTRAEOPORIDAE Alloiteau 1957

The specimens placed in this family are solitary and colonial. With regard to their skeletal morphology and microstructure, their common features are the presence of: 1 – the corallite wall (named here *rhipidotheca*), built by neorhypidacanth trabeculae; the wall and adjacent septa are in structural continuation (Figs 8B, 25C), 2 – an internal pseudowall (built by the internal subvertical part of large vesicular dissepiments), 3 – the endotheca developed in two different zones, outer – vesicular and inner – tabuloid, and 4 – more or less developed lonsdaleoid septa and septal auriculae.

The microstructure of aulastraeoporid corals studied here is like that of all rhipidogyrine corals. The skeleton is built by neorhipidacanth medium- to thick-size trabeculae.

It should be noted that *rhipidotheca* is slightly similar to *marginotheca* (wall in some solitary and phaceloid corals) (Mori & Minoura, 1980; see also Stolarski, 1995, p. 21, 40, fig. 11) but the latter is "built of the palisade of small-sized, distally oriented trabeculae" (Stolarski, 1996), and not branching ones as in the cases of the former.

The family Aulastraeoporidae includes three genera: *Aulastraeopora* Prever, 1909, *Preverastraea* Beauvais, 1976 and the new genus *Apoplacophyllia*. *Aulastraeopora* contains solitary forms (type species: *A. deangelisi* Prever), *Preverastraea* (= previously colonial *Aulastraeopora* Prever), colonial, cerioid forms (type species: *Aulastraeopora chelusi* Prever) and *Apoplacophyllia* n.gen. (type species: *Apoplacophyllia hackemesseri* n.sp.), phaceloid-dendroid corallum.

Recently the first of these genera was given a detailed description by Löser (1998a). This author placed *Aulastraeopora* together with *Preverastraea* in the suborder Heterocoeniina Beauvais. In this paper, these genera are placed into the suborder Rhipidogyrina, on account of skeleton microstructure similar to rhipidogyrines (see also Morycowa & Marcopoulou-Diacantoni, 1997; Morycowa *et al.*, 1999; Morycowa & Kołodziej, 2001).

Genus *Aulastraeopora* Prever 1909
Type species: *Aulastraeopora deangelisi* Prever 1909

Aulastraeopora aff. *deangelisi* Prever 1909
Fig. 13H

1909. *Aulastraeopora deangelisi* Prever: p. 138-139, text-figs 32-37.
1976. *Aulastraeopora deangelisi* Prever: L. Beauvais, p. 24, 25, pl. 5, fig. 2, pl. 6, fig. 2.
not 1982. *Aulastraeopora deangelisi* Prever: Liao, p. 166, pl. 13, figs 4a, b.
not 1994. *Aulastraeopora deangelisi* Prever: Liao & Xia, p. 75, pl. 58, figs 1, 2.
1996. *Aulastraeopora deangelisi* Prever: Baron-Szabo & Steuber, p.19, pl. 9, figs 1, 3.
1998a. *Aulastraeopora deangelisi* Prever: Löser, p. 63-64, text-fig.1, pl. 1, figs 1, 2.
2001. *Aulastraeopora* aff. *deangelisi* Prever: Morycowa & Kołodziej, figs 1, 2A-E.

Material: 1 specimen: UJ 158P 87; 6 thin sections: UJ 158P 87a-f.

Dimensions (in mm):

H	45
D	35-38
d cal	ca 33
d within pseudowall	9×10
S	12 (S1 + S2)
th S1 and S2 (near the wall)	ca 2
d of protocorallite	2.0-2.5
den cc	4-6 (8)/1
th w	(0.8) 1.0-1.5

Description: Subcylindrical corallite without epitheca. Calice shallow. 12 larger septa differentiated into two size orders, 6 longer reaching nearly the centre, 6 shorter; in the wall all nearly of the same thickness. Lateral surfaces of septa almost smooth. Rhipidotheca thin, preserved only in places. Pseudotheca present. Two zones of endothecal dissepiments, the outer with large vesicular dissepiments and the inner – with tabuloid ones. Large trabecular lamellae present in the outer zone.

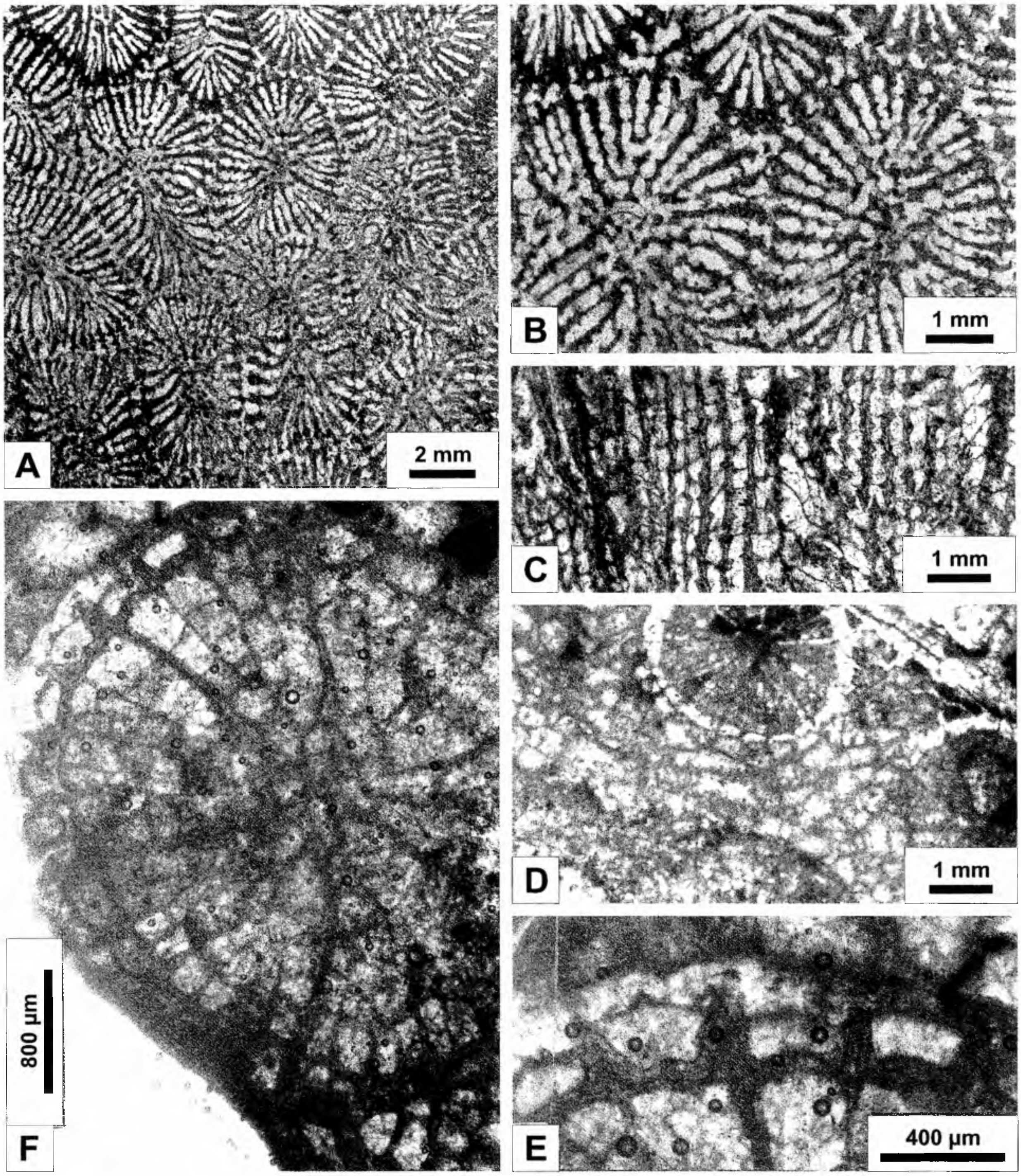

Fig. 12. **A–C.** *Ovalastrea baumbergeri* (Koby). A, B – transverse sections of corallites (thin section: UJ 158P 92a); C – longitudinal section showing thin endothecal vesicles (thin section: UJ 158P 92b); **D–F.** *Agathelia minor* Reig Oriol (thin section: UJ 158 25a): D – transverse section showing well developed exothecal zone between corallites; E – enlarged transverse section across the corallite wall; F – transverse section of one corallite showing arrangement of radial elements

Microstructure: Density of main trabecular centres along the septal mid-zone (transverse section): 4–6 (8) per 1 mm; lateral trabeculae (in transverse section) of the same diameter and density.

Remarks: The genus *Aulastraeopora* is known from Aptian to Cenomanian and the species *Aulastraeopora deangelisi* from Aptian and Albian only (Löser 1998a).

Aulastraea aff. *deangelisi* differs from that described by Prever (1909) from Italy (reg. Abruzzi) only in larger diameter of the corallites. *A. deangelisi* described by Baron-Szabo (in Baron-Szabo & Steuber, 1996) in the Aptian of the Delfi-Arachova reg. (Central Greece) has diameter intermediate between the specimens from Abruzzi and Agrostylia.

Distribution:

Aptian – Greece, near Delfi-Arachova (Parnassos region)
Albian – Italy, Apennines, Abruzzi (Monte d'Ocre)
Not Early Aptian–Albian – Tibet (Xizang)

Aulastraeopora graeca Morycowa new species
Fig. 13 (A–G)

Holotype: UJ 158P 88, Figs 13 (A–G).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (region of Parnassus in Central Greece).
Etymology: ***graeca*** – named after the country where the specimens come from.
Diagnosis of holotype: Height of corallite about 35 mm. Diameter of upper part of corallite 32×35 mm. Diameter within pseudowall ca 10×12. 48 septa arranged in 6 systems and in 4 size orders, 12 of them very thick, reaching almost the centre. Rhipidotheca thin. Two zones of endothecal dissepiments: outer – vesicular and inner – subtabuloid. Microstructure: Density of calcification centres along the septal mid-zone (transverse section) and lateral trabeculae: 4–7 per 1 mm.
Material: 2 specimens: UJ 158P 88 and 89; 4 thin sections: UJ 158P 88a-c, 89a.
Dimensions (in mm):

H UJ 158P 88	ca 35
D UJ 158P 88	32×35
d cal	17×20
d within pseudowall	ca 10×12
S	48 (S1-S4)
th S1 (near the wall)	0.8-1
th S1 (in mid-length)	1.5-2
th S4 (near the wall)	0.8
d of protocorallite	2×2.5
den cc	4-7 (8)/1
d main tr	ca (120) 140-250
den gr (transv. section of septa)	4-7/1
th w	0.8-1

Description: Solitary, subcylindrical corallite with circular and moderately deep calice. Septa 48 in number, arranged in 6 systems and in 4 size orders. They are subequal in the wall region. In the calice, 12 of them almost reach the centre. The septa of the second cycle considerably thinner at internal ends; the septa of the third cycle slightly shorter than S1 septa , and the septa of the fourth cycle about 1/2 the length of S1. Lateral surface of septa in the outer zone are nearly smooth or with fine granulations (Fig. 13F). Near the axial part they have very prominent trabecular extensions (Fig. 13E). The tip of the protocorallite, circular in outline, is about 2 × 2.5 mm in diameter and two cycles of septa are arranged in bilateral symmetry (one of the septa larger and longer). Rhipidotheca thin, only partly preserved. The outer zone of endotheca consists of vesicular dissepiments and tabuloid ones in the inner corallite zone. At the boundary of these two zones an internal pseudowall is formed.
Microstructure: In transverse section, a narrow median-septal zone can be observed, composed of small calcification centres and a large zone of lateral, subhorizontally oriented secondary trabeculae (Fig. 13F). In some places also structural continuation of septa with the wall is visible.
Remarks: *Aulastraeopora graeca* n. sp. differs from other species of this genus in more numerous septa.

Genus *Preverastraea* Beauvais 1976
Type species: *Aulastraeopora chelusii* Prever 1909

Preverastraea felixi (Hackemesser 1936)
Figs 14 (A–E), 25C

v1936. *Phyllocoenia felixi* Hackemesser: p. 16-17, pl. 2, figs 1-4.
1997. *Preverastraea felixi* (Hackemesser): Morycowa & Marcopoulou-Diacantoni, p. 260-261, text-fig. 9, pl. 5, figs 1-6, pl. 6, figs 3, 4.

Material: 1 colony: UJ 158P 27 and 5 fragments of colonies: UJ 158P: 6, 7, 9, 10, 15; 14 thin sections: UJ 158P: 6a, 7a-d, 9a, b, 10a, b, 15 a, b, 27a-c.
Dimensions (in mm):

H UJ 158P 27	ca 45
D UJ 158P 27	ca 40×80
d corallites	8-17
d within pseudowall	4-8
S	18-24 S1-S3 + n S lonsdaleoid
th S (near the wall)	0.7-1
den gr	5-6/1
d tr (transv. section)	(60) 80-140 (200) μm
den cc	ca 3-5/400 μm
th w	ca 0.7-1

Remarks: The specimens from Agrostylia were described in 1997 by Morycowa & Marcopoulou-Diacantoni (1997). Recently the specimens: UJ 158 6 and 9 have been added to this collection.

It should be mentioned here that the diameters of corallites *P. felixi* and *P. paronai* (Prever) are similar. The material examined permits to indicate the following features of the septal apparatus differentiating these two species. In *P. felixi* all septa (S1–S3) extend from the corallite wall and they are subequal in thickness in the outer zone of corallites; lonsdaleoid septa occur sporadically. In *P. paronai* (Prever, 1909) the S1 septa extend from the wall, S2 go off from the wall or are lonsdaleoid and S3 are always lonsdaleoid. Moreover, in *P. paronai*, S1 septa are usually thicker than S2 (see Prever, 1909: p. 141, fig. 43; L. Beauvais, 1976, fig. 6.
Distribution:
Cenomanian – Central Greece, Panourgias (old name Dremisa) in the Giona region

Preverastraea diplothecata (Hackemesser 1936)

v1936. *Phyllocoenia diplothecata* Hackemesser: p. 16-17, pl. 2, figs 1-4.
1997. *Preverastraea diplothecata* (Hackemesser): Morycowa & Marcopoulou Diacantoni, p. 259-260, text-fig. 8; pl. 4, figs 4-6; pl. 6, figs 1, 2.
1999. *Preverastraea diplothecata* (Hackemesser): Morycowa *et al.*, p. 108.
2001. *Preverastraea diplothecata* (Hackemesser): Morycowa & Kołodziej, fig. 3A, B.

Material: 2 specimens: UJ 158P 11 and 109; 5 thin sections: UJ 158P 11a-d, 109a.
Dimensions (in mm):

H	ca 40
D	30×50
d cor	(5.5) 6.0-9.5 (10)
d within pseudowall	(2) 2.5-3.0
c-c	5-8
S	12 (6 S1 + 6 S2) + n S3
th S (near the wall)	(0.3) 0.5-0.7 (1)
den gr	ca 4-7/1
den cc	ca 3-5/400 μm
th w	(0.2) 0.3-0.5 (0.7)

Remarks: Description and illustrations of the specimen from the Agrostylia were presented by Morycowa & Marcopoulou Diacantoni (1997). It needs to be added that the specimen from Agrostylia differs slightly from the syntype (No.: D 6121, Museum of Natural History, Basel) described by Hackemesser (1936) in more rarely occurring septa S3.

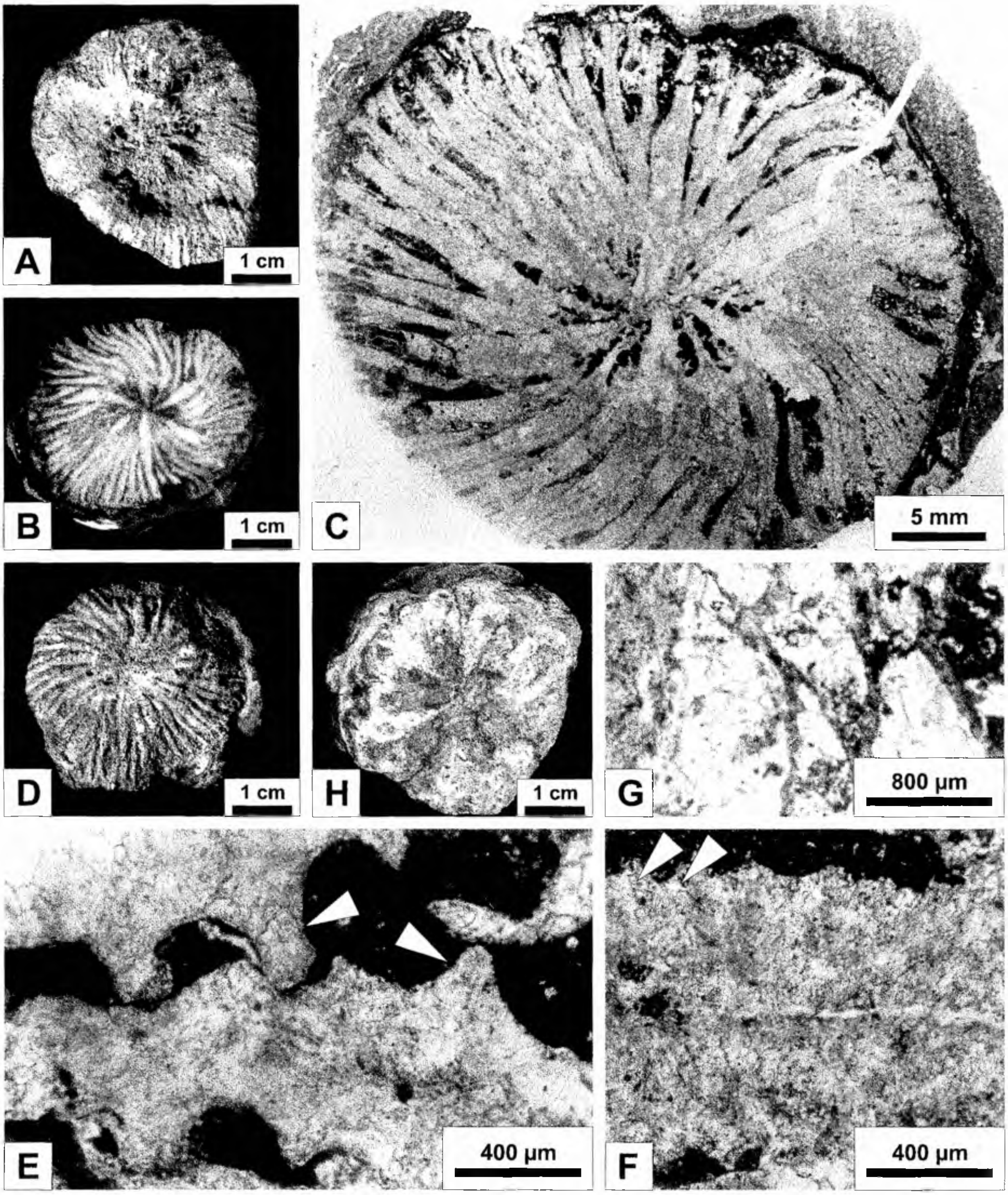

Fig. 13. **A–G.** *Aulastraeopora graeca* Morycowa n.sp.; holotype (UJ 158P 88): A – calicular surface, slightly abraded; B – polished older portion of corallite showing septa arranged in hexameral symmetry; C – transverse section of specimen showing thick septa arranged in hexameral symmetry and small diameter of central area within pseudowall (thin section: UJ 158P 88a); D – view of lower part of specimen presented in B, before polishing; E, F – transverse section of septa showing, in E, their internal part with big, prominent trabecular extensions (arrows), and in F, the median part of septa with traces of calcification centres or their traces in the form of mid-septal line, as well as traces of lateral trabeculae (arrows) with tips expressed on the lateral septal surface in the form of regular granulations (thin section: UJ 158P 88a); G – longitudinal section across peripheral endothecal zone of corallite presenting large, suboblique dissepiments; **H.** Calicular view of *Aulastraeopora* aff. *deangelisi* Prever, UJ 158P 87, specimen presented in Morycowa & Kołodziej (2001, figs 1, 2A-E)

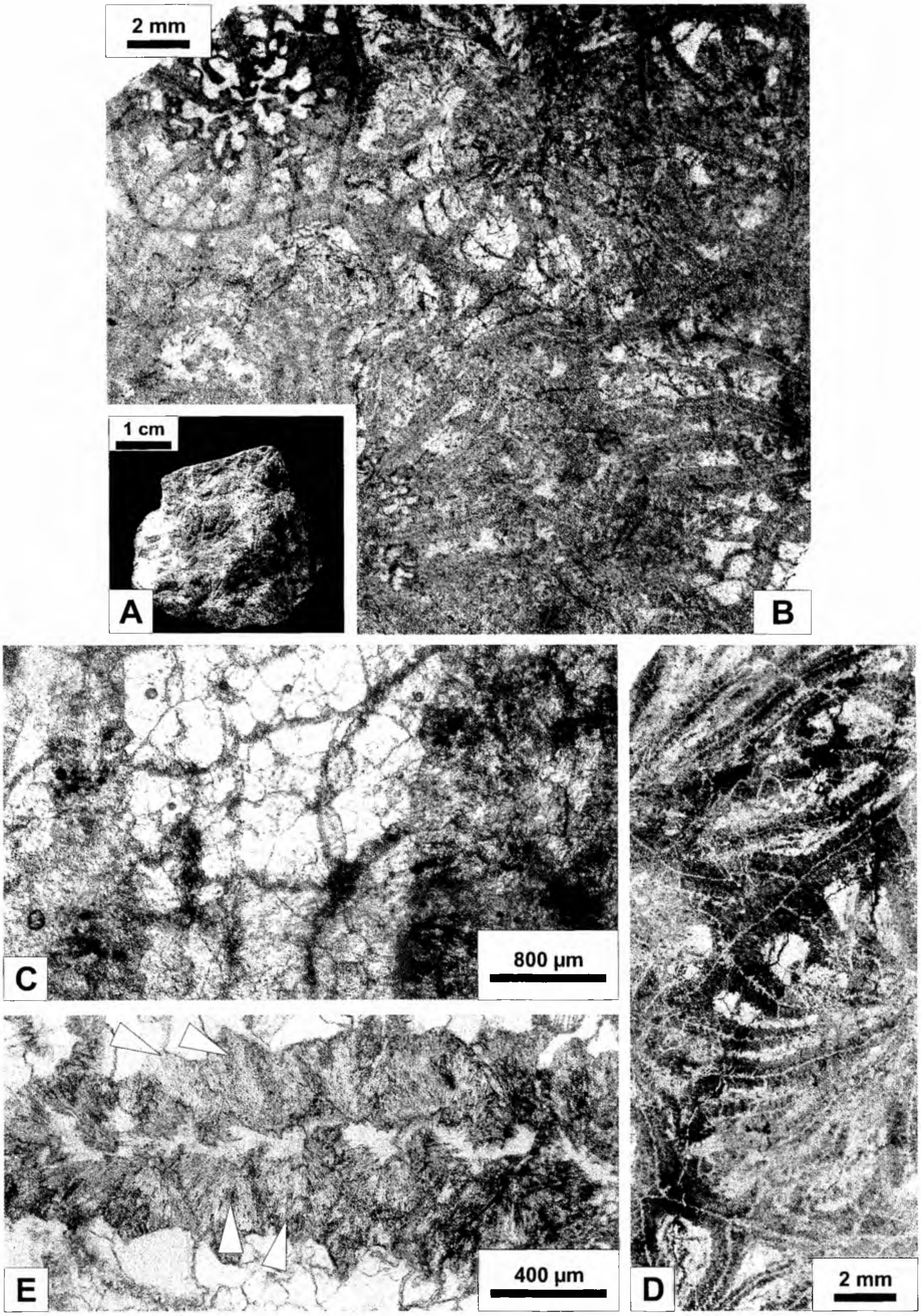

Fig. 14. A–E. *Preverastraea felixi* (Prever): A – fragment of calicular surface of cerioid colony (specimen: UJ 158P 7); B – transverse section of corallites (thin section: UJ 158P 7a), showing one young individual and budded maternal corallites (see – in upper right corner); C – longitudinal section of the part of corallite illustrating two zones of endothecal elements: outer vesicular and inner subtabuloid (thin section: UJ 158P 7b); D – transverse view in thin section (UJ 158P 6a), showing the traces (white) of wall and septal microstructure; E – enlarged portion of D to show mid-septal zone with the traces of linear disposition of weakly separated calcification centres and subhorizontally disposed lateral trabeculae (arrows)

Preverastraea diplothecata differs from all the species from the genus *Preverastraea* having the same diameters of corallites, i.e. *P. chelusi*, *P. paronai* and *P. isseli*, from the Abruzzi in Italia (Prever 1909), i.a. in having all the septa S1, S2 i S3 extend from the wall of corallites. In the Italian specimens, S1 extend from the wall of corallites, S2 – from the wall or they are lonsdaleoid, and the higher septa (S3), if they are present, are always lonsdaleoid.

Distribution:

Cenomanian – Central Greece, Panourgias (old name Dremisa) in the Giona region

Preverastraea isseli (Prever, 1909)
Figs 9E, 15 (A–C)

1909. *Aulastraeopora isseli* Prever: p.142-143, text-figs 44-47, pl. 10, figs 31, 31a, 34.
1976. *Preverastraea isseli* (Prever): L. Beauvais, pl. 5, fig. 4.
1977. *Preverastraea isseli* (Prever): M. Beauvais, p. 280, pl. 3, figs 1, 3.
?1985. *Preverastraea isseli* (Prever): Liao & Xia, p. 154, pl. 12, figs 3-6.
?1994. *Preverastraea* cf. *isseli* (Prever): Löser, p. 15-16, pl. 5, figs 3, 4.
1997. *Preverastraea isseli* (Prever): Morycowa & Marcopoulou-Diacantoni, p. 261, pl. 2, figs 3-5.
2001. *Preverastraea isseli* (Prever): Morycowa & Kołodziej, fig. 3A, B, figs 4A-C.

Material: 3 specimens: UJ 158P: 12/1, 12/2, 12/3; 4 thin sections: UJ 158P 12/1a-c and 12/3a.

Dimensions (in mm):

D UJ 158P 12/1	ca 40×60
H UJ 158P 12/1	ca 40
d cor	8-10
d within pseudowall	3.5-4.5 (5)
S	6S1 + ca 6S2 + n lonsdaleoid S3

Remarks: The specimens No. 12/1 and 12/2 were described in 1997 by Morycowa and Marcopoulou-Diacantoni. Later one more specimen was found (No.:12/3), presented in the note by Morycowa & Kolodziej (2001, fig. 4A-C).

Distribution:

Albian – Italy, Abruzzi (Monti d'Ocre)
?Albian–Cenomanian – Tibet, Bangoinin
?Cenomanian – Germany, Westphalia

Preverastraea marinosi Marcopoulou-Diacantoni & Morycowa new species
Fig. 16 (A–E)

Holotype: UJ 158P 16, Fig. 16 (A–E).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (region of Parnassus in Central Greece).
Etymology: the name *marinosi* is proposed in honour and memory of Professor Georges P. Marinos, Director of the Department of Earth Sciences, National University of Athens.
Diagnosis: Subcircular and subpolygonal corallites of diameters from 4.5–7 mm; diameter within the pseudowall – 2.5–3 mm. 20–24 septa arranged in radial, hexameral and slightly bilateral symmetry. Rhipidotheca thin. Septa S1 very thick, extend from the wall and reach almost the centre of corallites, frequently one of them is a little longer. Six S2 septa slightly thinner, particularly in their internal part, going off mainly from the wall. Septa S3 very thin and short, lonsdaleoid, sometimes incompletely developed. Ornamentation by numerous fine, pointed granulations, and by trabecular projections on the adaxial part of septa. Two zones of endothecal dissepiments: outer – vesicular and inner – subtabuloid. In 5 mm of the longitudinal section of outer zone of corallites: 5–7 dissepiments. Microstructure: In cross section, the density of calcification centres in the wall and septa about 3–6/400 µm. Septa in structural continuation with the wall.
Material: 2 colonies No.: UJ 158P 16 and 26; 8 thin sections: UJ 158P 16a-d, 26a-d.
Dimensions (in mm):

D UJ 158P 16	ca max 60×70; upper surface 40×50
H UJ 158P 16	ca 90
D UJ 158P 26	8×12
H UJ 158P 26	6.5
d cor	4.5-7.0 (7.5)
d within pseudowall	(2) 2.5-3 (3.3)
S	6S1 + 6S2 + n. S3 lonsdaleoid
th S1 (in wall zone)	0.5-0.7
th w	0.3-0.5
den gr (transv. sect.: septa and wall)	5-7 (9)/1
den cc (mid-septal zone)	3-6/400 µm
den end (wall zone)	5-7/5

Description: Two massive, cerioid colonies. The corallites in the transverse section are subcircular, subelliptic and subpolygonal. Budding intracalicinal, marginal; new individual or individuals occur between wall and pseudowall. In transverse section, rhipidotheca rather thin, more frequently thinner than para- thecal pseudowall. Septa disposed in radial, hexameral symmetry, differentiated into three size orders. S1 and generally S2 , extend from the wall, small thin S3 lonsdaleoid septa can be seen on the dissepimental surface of the pseudowall. Internal septal part with trabecular projections and mainly in one larger S1 auricula-like forms are visible (Fig. 16B). Lateral surfaces of the wall and septa covered by very fine, pointed, regular granulations. Endotheca consists of two zones of dissepiments, vesicular in the outer zone and subtabuloid in the inner part of corallites.
Microstructure: Mid-septal zone composed of medium- to thick-sized trabeculae (from about 80 up to 160 µm in diameter). In some septa only white, rather straight mid-septal line is visible. The tips of secondary trabeculae are expressed on the lateral septal surfaces as fine granulations (Fig.16B). Trabecular projections on the adaxial part of septa occur irregularly.
Remarks: Skeletal architecture and diameter of corallites distinguishes the species *P. marinosi* from the other *Preverastraea* species.

Preverastraea robusta Morycowa new species
Fig. 17 (A–C)

Holotype: UJ 158P 31, Fig. 17 (A–C).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (region of Parnassus in Central Greece).
Etymology: Latin: *robustus* – strong; after thick radial elements.
Diagnosis: Polygonal corallites of diameters from 25 up to 40 mm and within the pseudowall about 10 mm. Three complete cycles of septa and fourth incomplete, arranged hexamerally and slightly bilaterally. Septa bicuneiform, free on their inner margins. All septa extend from the wall; S1, S2 and S3 septa subequal in thickness and slightly differentiated in length, reach or almost reach the centre of corallites. Trabecular projections present in the internal part of septa. Density of outer vesicular dissepiments about 5–7 per 5 mm, inner subtabuloid dissepiments – sparse. Microstructure: neorhipidacanth trabeculae of the diameter from about 100 up to 150 µm. Lateral (secondary) trabeculae regularly distributed, subperpendicular to the axis of the main ones (Fig. 17B). Septa in structural continuation with the wall.
Material: 2 fragments: UJ 158P: 31 and 32; 3 thin sections: UJ 158P 31 a, b, 32a.

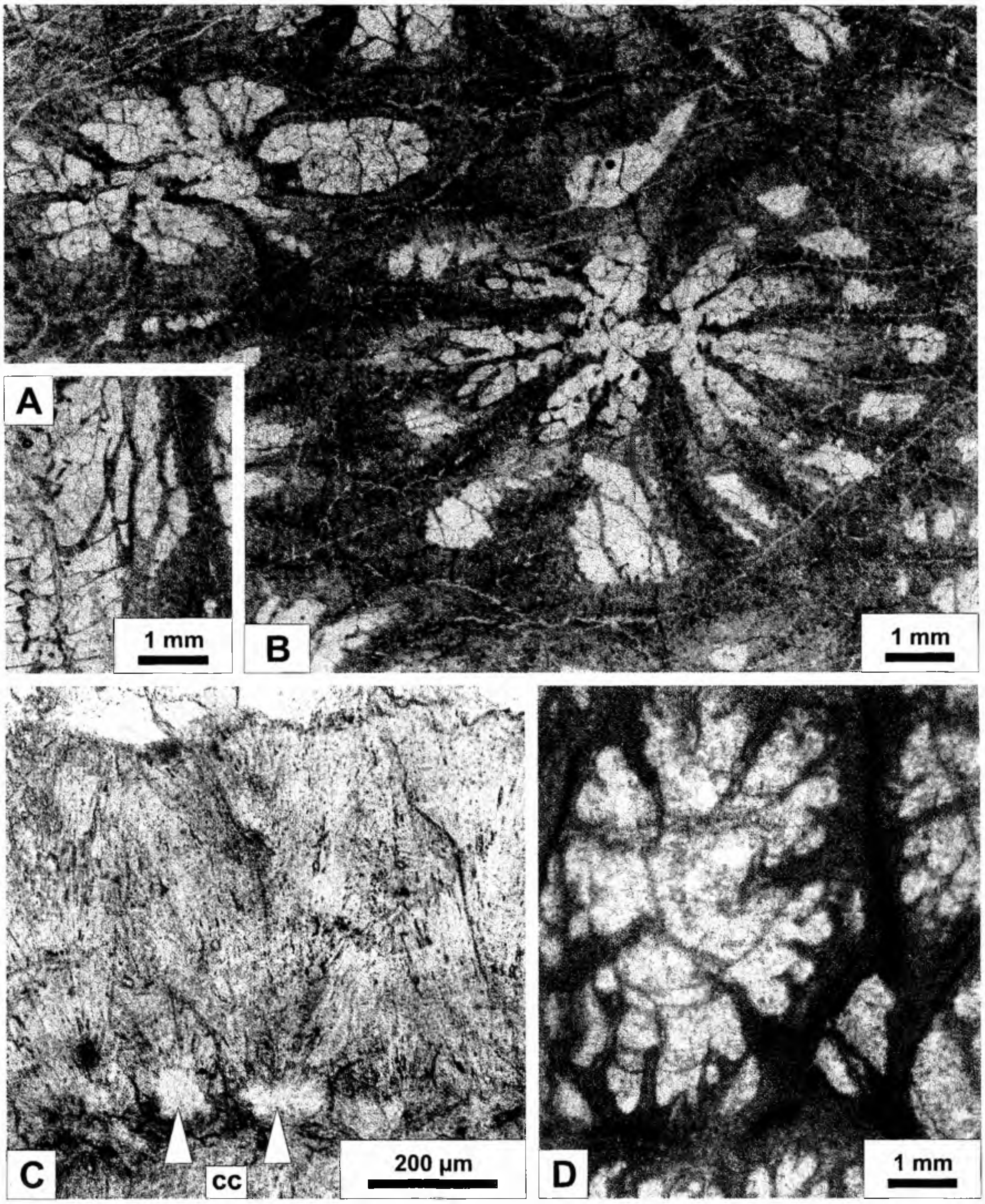

Fig. 15. **A–C.** *Preverastraea isseli* (Prever): A – longitudinal section across the wall and axial zones showing endothecal elements differentiated into two zones, the peripheral one as vesicles, and the internal zone formed as large subhorizontal dissepiments (thin section: UJ 158P 12/1b); B – transverse thin section of corallite (UJ 158P 12/1a). Note well developed wall, pseudowall and septa of two orders, as well as numerous lonsdaleoid septa (thin section: UJ 158P 12/1a); C – enlarged septal portion from B, illustrating traces of calcification centres (arrows: cc) and long fibre bundles of secondary trabeculae, subperpendicular to margin of septum. **D.** *Paraacanthogyra parnassensis* Morycowa & Marcopoulou-Diacantoni. Transverse thin section (UJ 158P 28a) showing the septa of two first cycles well developed and that of the higher cycle more frequently lonsdaleoid and weakly developed

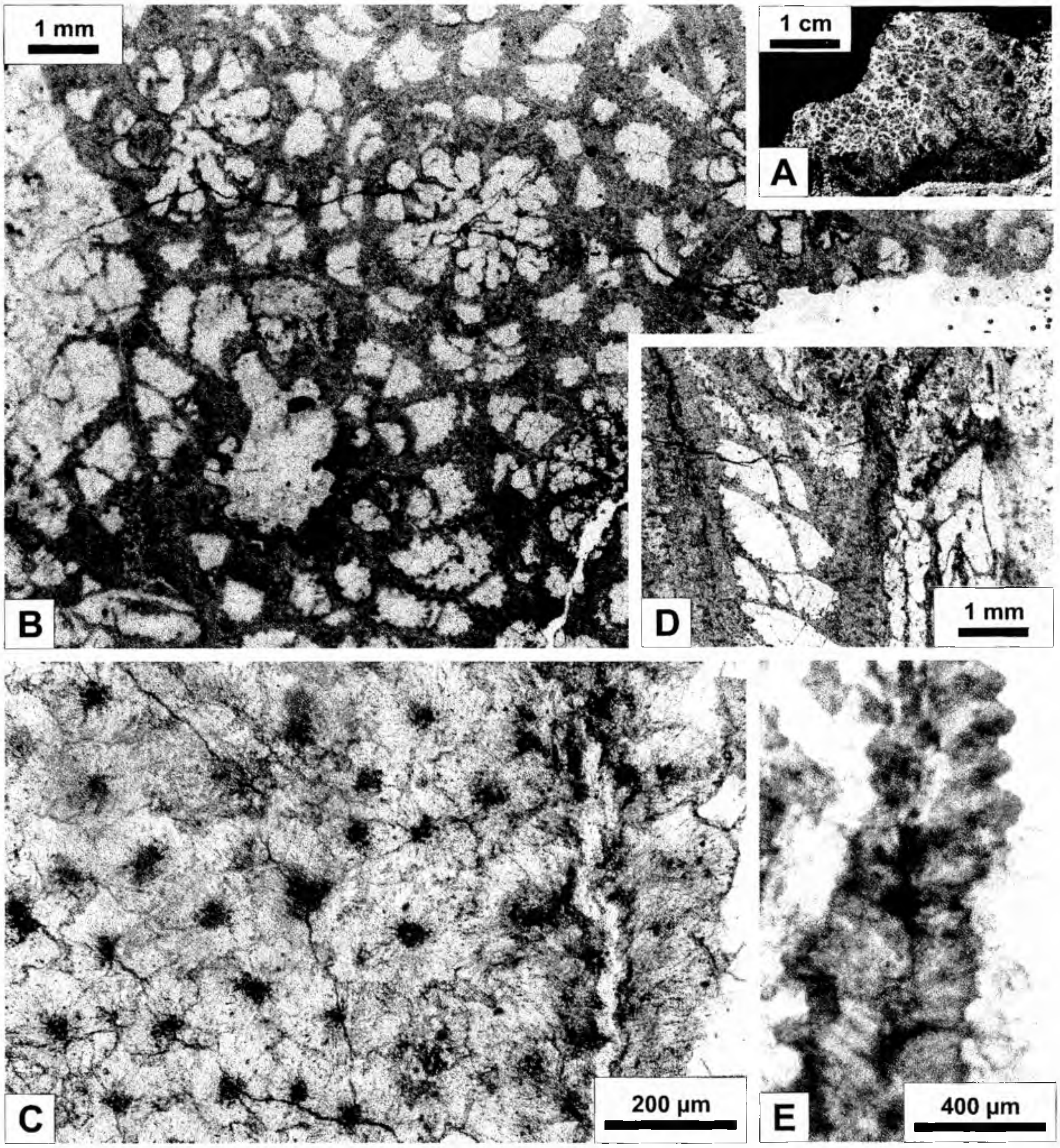

Fig. 16. **A–E.** *Preverastraea marinosi* Marcopoulou-Diacantoni & Morycowa n.sp.; holotype (UJ 158P 16): A – fragment of calicular surface of colony, slightly polished; B – transverse thin section illustrating septal and wall granulations, septal auriculae on S1 (upper left corner), numerous lonsdaleoid septa of higher cycles, and very distinct pseudowalls; C – longitudinal thin section (UJ 158P 16b) of septal plate, with calcification centres of lateral trabeculae orientated subperpendicularly to septal flanks; D – longitudinal thin section of corallite to illustrate vesicular dissepiments between wall and pseudowall (thin section: UJ 158P 16b); E – enlarged portion of longitudinal thin section of septum, cut perpendicularly to the septal plate, showing the traces of axes of branching trabeculae (thin section: UJ 158P 16c)

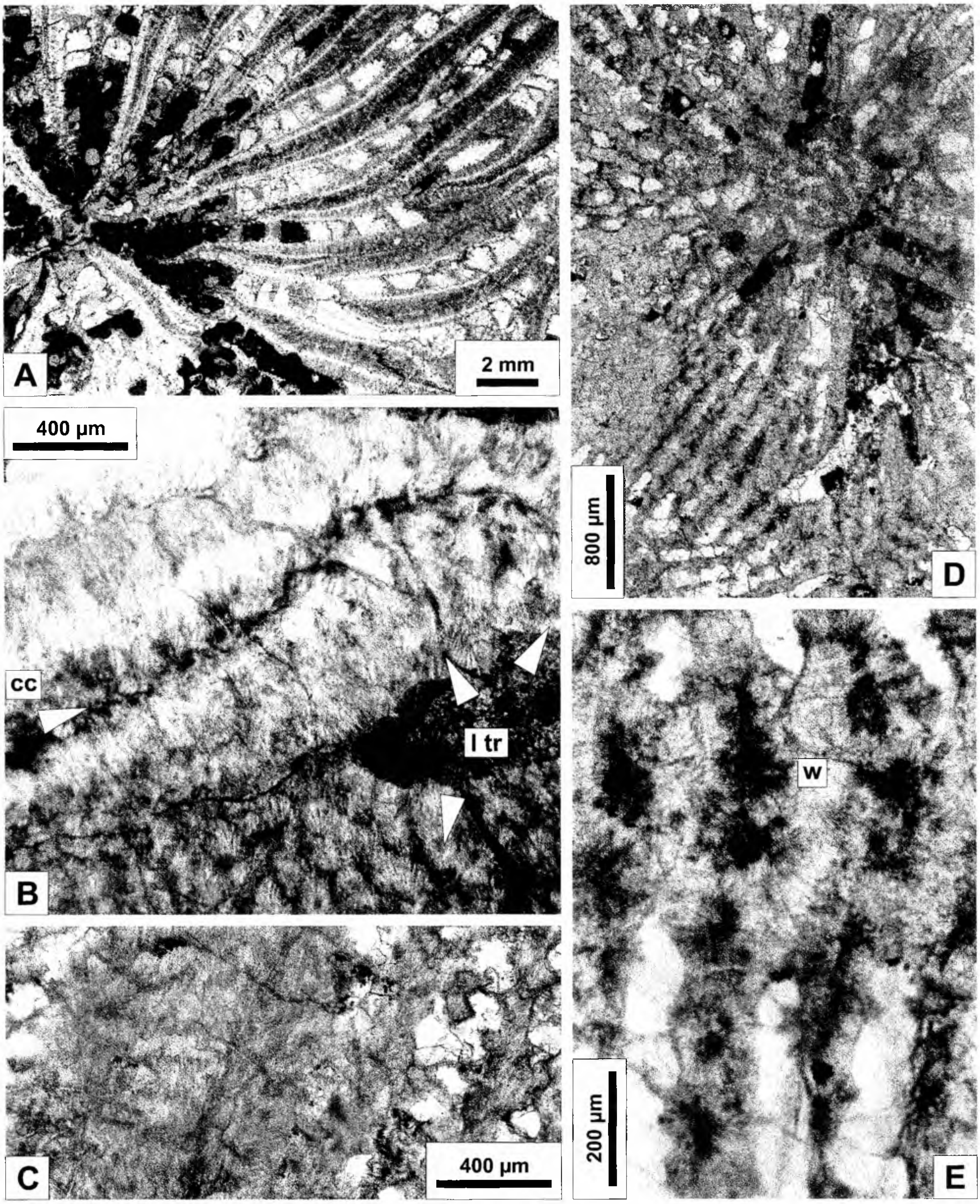

Fig. 17. **A–C.** *Preverastraea robusta* Morycowa n.sp., holotype: A – transverse thin section of corallite (UJ 158P 31a); B – enlarged septal portion from A, illustrating traces of septal microstructure. Note dark mid-septal zone with linear concentrations of not well separated calcification centres (cc: arrow) and well developed lateral trabeculae (arrows: l tr) seen as fibre bundles, trabecular axes or calcification centres, depending on their orientation; C – septum in longitudinal section. **D, E.** *Mixastraea polyseptata* Morycowa n.sp.: D – fragment of transverse thin section (UJ 158P 101a) presented in Fig. 36A; E – enlarged septal portion from D showing confluent and subconfluent septa in the wall (w) zone. Note well-separated calcification centres in the radial elements

Dimensions (in mm):

D UJ 158P 31	ca 70×76
H UJ 158P 31	ca 35
d cor	25-40
d within pseudowall	ca 10
S	ca 24 (S1-S3) + n S4 lonsdaleoid
th S1 (at mid-length)	ca 1.5
th w	0.3-0.5
den gr (transv. sect., septa and wall)	5-7/1
den cc	(2) 3-4 (5-8)/400 μm
d tr	(50-80) 100-150 (200) μm
den end (wall zone)	5-7/5

Description: Two small fragments of massive, cerioid colonies with several corallites. The shapes of corallites, in the transverse section, are subpolygonal. Rhipidotheca rather thin. Septa very long, bicuneiform, free on their inner margins. Their largest thickeness, near the pseudowall-zone, is 1.3–1.5 mm, in outer and inner zone ca 0.5–0.8 mm. Septa hexamerally and slightly bilaterally arranged. Bilateral symmetry is marked by one thicker septum S1. Septa S1, S2 and S3 subequal in thickness and slightly differentiated in length. They extend from the wall and reach or almost reach the centre of corallites. Septa S4, not completely developed, extend from the wall and constitute 1/3–1/4 of S1 length. Skeleton ornamentation granular; trabecular projections present, mainly in the internal margin of septa. Outer vesicular dissepiments abundant, inner subtabuloid sparse.
Microstructure: In transverse thin sections of septa, most frequently only axial dark zone with traces of calcification centres to be observed (Fig. 17B). In places, along this zone, traces of trabecular section are marked. Secondary trabeculae well developed.
Remarks: The species presented differs from other species in its large corallite diameters and very thick septa with rather well preserved skeleton microstructure.

Preverastraea sp.

Material: 1 colony: UJ 158P 33, 2 thin sections: UJ 158P 33a, b.
Dimensions (in mm)

d cor	4-7
S	12 (S1 + S2) + n S3
th w	0.3-0.5
den cc (mid-line)	3-6/400 μm

Remarks: The specimen mentioned in Morycowa *et al.* (1999) as *Columnogyra micra* (Eliášová) (original name *Acanthogyra micra* Eliášová, 1973) does not represent this species. A later study of other transverse thin sections made from this specimen indicated the presence in some corallites of the internal pseudowall and the lack of the columella (there is only one slightly longer S1 passing through the centre). The specimen described here possesses the features of the both genera: *Acanthogyra* Ogilvie and *Preverastraea* Beauvais. The new material will help to classify this taxon.

Genus *Apoplacophyllia* Morycowa new genus
Type species: *Apoplacophyllia hackemesseri* n.gen., n.sp.

Etymology: Greek: *apo* – from, off, away; the new genus is related to *Placophyllia*.
Diagnose: Phacelo-dendroid colony with rounded or oval corallites in transverse section. Intracalicinal peripheric budding. Rhipidotheca thin. Parathecal pseudowall present. Radial elements as free, compact septa. Lonsdaleoid septa rare. Columella absent. Endotheca vesicular in the outer zone of corallites and subtabuloid in their internal part. Microstructure: neorhipidacanth; thick-sized trabeculae of radial elements disposed in series.
Species included: The genus is monotypic.
Geographic and stratigraphic distribution: Albian – Agrostylia in the Parnassos region.
Remarks: *Apoplacophyllia* seems to be allied with *Placophyllia* d'Orbigny, known from the Jurassic, rare in the Cretaceous, but differs from it in the absence of the columella, the presence of internal pseudowall and in the presence, although rare, of lonsdaleoid septa.

Apoplacophyllia hackemesseri Morycowa new species
Fig. 18 (A–F)

Holotype: UJ 158P 86, Fig. 18 (A–F).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (region of Parnassos in Central Greece).
Etymology: *hackemesseri* – in honour of Max Hackemesser, geologist and paleontologist, to whom we owe the knowledge of the Cretaceous corals from Parnassos-Giona region (Central Greece).
Diagnosis: Phaceloid-dendroid colony. Corallites up to 40 mm in height and subcircular or oval in transverse section, having the diameters from 11 to 18 mm, 42 to 48 septa alternating in thickness and arranged in three or four size orders. Their density in the wall zone is 5 per 2 mm. Density of septal granulations in transverse section is 5–7 per 1 mm. Density of lateral trabeculae, in transverse section, is from ca 5 to 7 per 1 mm.
Material: 2 incomplete colonies: UJ 158P 86 and 82; 3 thin sections: UJ 158P 86a-c.
Dimensions (in mm):

D	ca 60 × 60
d cor	11-18
h cor	ca 35-40
S	42-48
th S1	ca 1
den s	5/2
den cc	5-7/1
den gr (transv. sect.)	5-7/1

Description: Two incomplete phaceloid-dendroid colonies. Corallite height up to 40 mm. Rhipidotheca thin, preserved only in places. Corallites elliptic in transverse section. Four cycles of septa arranged in three, rarely four, size orders, generally thick but alternate in thickness in the wall zone. The septa S1 reach the centre of corallites, septa S2 are subequal to S1 but thinner in their internal edges, septa S3 have about half or 1/3 of the length of S1, and septa S4 are very short and visible only in the outer zone of corallites. Lateral faces of septa covered by fine granules (Fig. 18B, D) arranged in places subperpendicularly to the distal edge of septa. Endotheca composed of vesicular dissepiments in the outer zone of corallites and tabuloid ones in the centre.
Microstructure: Rather well preserved, neorhipidacanth-type. The diameters of trabeculae are most frequently (100) 140–200 μm.

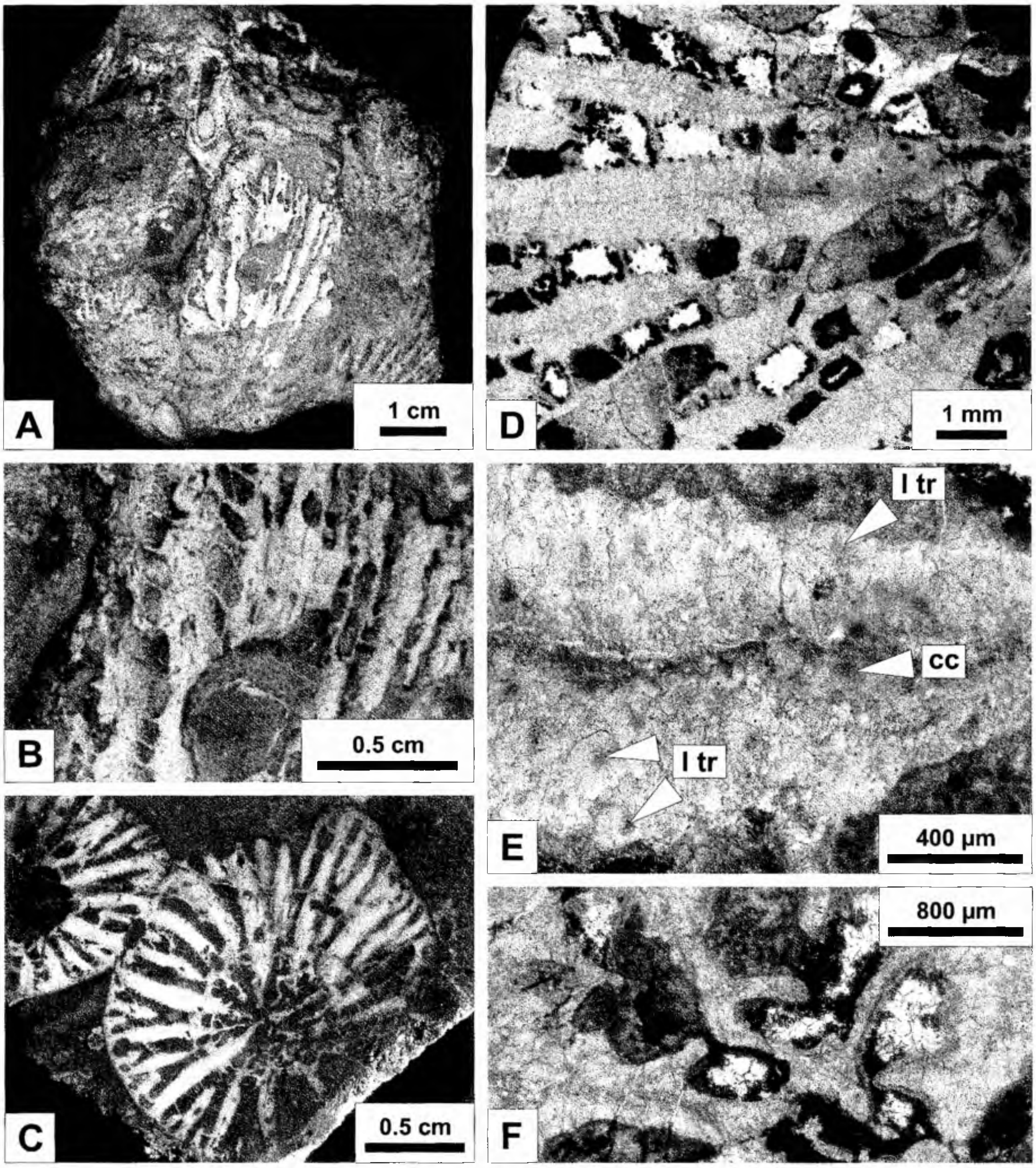

Fig. 18. **A–F.** *Apoplacophyllia hackemesseri* Morycowa n.gen, n.sp.; type species and its holotype (UJ 158P 36): A – Lateral view of the corallum; B – magnified fragment of the same specimen in lateral view; C – transverse, polished surface of corallites showing rhipidothecal wall of corallites, internal pseudowall and arrangement of septa in hexameral symmetry; D – transverse thin section across septa (UJ 158P 36a); E – enlarged portion of D showing mid-septal zone in places with trabecular centres of main trabeculae (arrow: cc) and lateral trabeculae visible as bundles of fibres or trabecular centres (arrows: l tr); F – transverse section of axial part of corallite, illustrating internal part of S1 and S2 septa with prominent trabecular extensions (thin section UJ 158P 36a)

Family RHIPIDOGYRIDAE Koby 1905

Genus *Paraacanthogyra* Morycowa et Marcopoulou-Diacantoni 1997
Type species: *Paraacanthogyra parnassensis* Morycowa et Marcopoulou-Diacantoni 1997

Paraacanthogyra parnassensis, Morycowa et Marcopoulou-Diacantoni 1997
Fig. 15D

1997. *Paraacanthogyra parnassensis* Morycowa & Marcopoulou-Diacantoni: p. 257-258, text-fig. 6, pl. 3, fig. 1-4.

Remarks: This species was described in 1997 by Morycowa and Marcopoulou-Diacantoni and with some reservations placed in the family Rhipidogyrina, as its microstructure is not well preserved. The microstructure seems to be finer than in other rhipidogyrines. This may be a diagenetic effect.

Paraacanthogyra differs from *Acanthogyra* Ogilvie in richly developed vesicular dissepiments, and lonsdaleoid septa as well as in the absence of columella. It differs from *Preverastraea* in the absence of the internal pseudowall and in increase by division.

Suborder MEANDRIINA Alloiteau 1952
Family Meandrinidae Gray 1847

Genus *Parnassomeandra* Morycowa new genus
Type species: *Parnassomeandra diacantoniae* n.gen., n.sp.

Etymology: from the Parnassos region and meandroid form of colony.

Diagnosis: Phacelo-meandroid colony with generally monolinear, laterally free series. Each corallite series covered by thin epitheca. Intramural budding. Calicular centres indistinct. Radial elements developed as compact, free costosepta. Columella absent. Wall parathecal-septothecal. Endotheca tabuloid. Mini- to medium sized, simple trabeculae of the radial elements suggest its systematic position in the family Meandrinidae, suborder Meandriina.

Species included: The genus is monotypic.

Geographic and stratigraphic distribution: Albian – Agrostylia in the Parnassos region; Albian/Aptian – Spain, Cantabria (see remarks concerning *P. diacantoniae* n.sp.).

Remarks: The new genus seems to be related to the genus *Strotogyra* Wells (1937), however, it differs from it in the colony being composed of more than one corallite series (after Wells "corallum contorted, formed by one continuous laterally free, series") and in the absence of columella.

Parnassomeandra diacantoniae Morycowa new species
Figs 19 (A–D), 35D

Holotype: UJ 158P 38, Figs 19 (A–D), 35D.

Type-level: Albian; Subpelagonian Unit, Parnassos area.

Type-locality: Agrostylia (region of Parnassus in Central Greece).

Etymology: *diacantoniae* – named to honour Professor Anastasia Marcopoulou-Diacantoni from whose collection the Parnassos specimens come.

Diagnosis: Width of calicular series mainly 3–3.5 mm. Costosepta of two, in places three, size orders. Density of costosepta: 5–7 per 2 mm in the wall region. Density of endothecal tabuloid elements: 3–4 per 2 mm.

Material: 1 colony: UJ 158P 38, 3 thin sections: UJ 158P 38a-c.

Dimensions (in mm):

	Holotype: UJ 158P 38
D	68×54
H	74
width of corallite series (between walls)	(2.5) 3.0-3.5 (4.0)
den s	5-7 /2 mm (3S1 + 2S2 or 4S1 + 3S2 or 2S1 + 2S2 + 3S3)
den end	3-4/2 mm
den cc	ca 7-8/400 µm

Description: Phaceloid-meandroid colonies. Corallite series in general monolinear, more or less sinuous, less frequently ramified. In places, two adjacent strongly geniculate corallite series connected laterally. The lateral surfaces of series are covered by a very thin epitheca. Radial elements are shaped as well-developed septa thickened in the wall region, and as very short costae. The septa represent two, in places three, size orders. The lateral faces of septa are smooth or covered by fine granulations. Wall thin, septothecal, in places parathecal. The endothecal tabuloid elements are slightly convex. Budding intramural, mainly terminal.

Microstructure: Microstructure preserved in traces, showing simple, mini- to medium sized trabeculae, disposed in one median line, except peripheral part where the trabeculae are frequently medium to thick-sized and in places branched.

Remarks: Neuweiler presented (1995, pl. 9, fig. 1; pl. 56, fig. 5) transverse sections of the specimens from Aptian/Albian sediments of Cantabria, Spain, which represent *Parnassomeandra diacantoniae* n.sp. The morphology of the *P. diacantoniae* n.sp. is superficially similar to that of the *Pachygyra bellula* Hackemesser (Hac- kemesser, 1936, 1937) described from Cenomanian of the Panourgias (=old name: Dremisa) in Giona Massif (Greece). They have similar forms, and dimensions of calicular series. Nevertheless, the fact that *P. bellula* has columella and richly developed peritheca connecting calicular series makes these two taxa distinct. Also their skeletal microstructure appears to be different.

Genus *Meandroria* Alloiteau 1952
Type species: *Meandrina radiata* Michelin 1847

Meandroria sp.
Fig. 32F

Material: Fragment of colony: UJ 158P 39, 1 thin section: UJ 158P 39a.

Dimensions (in mm):

col-col	ca 3-5 mm
den s	7/2

Remarks: Small poorly preserved fragment of meandroid colony. Corallite series long, corallite centers indistinct. Radial elements mainly subequal, confluent, subconfluent and less often nonconfluent. Paliform lobes occur on internal septal edges. Wall probably septothecal. Columella styliform, subcircular in transverse section, in places lamellar. Endotheca not visible.

Suborder ARCHEOCOENIINA Alloiteau 1952

It is necessary to correct the emended diagnosis of the suborder Archeocoeniina given by Roniewicz (1989: p.102), concerning the increase of corallum. The increase is not only "by extracalicular budding" but also by intracalicinal marginal budding and by division of maternal corallites (see in *Actinastrea* d'Orbigny, in e.g., Alloiteau, 1957, p. 55; Morycowa, 1971, text-fig. 12, pl. 1, fig. 3b).

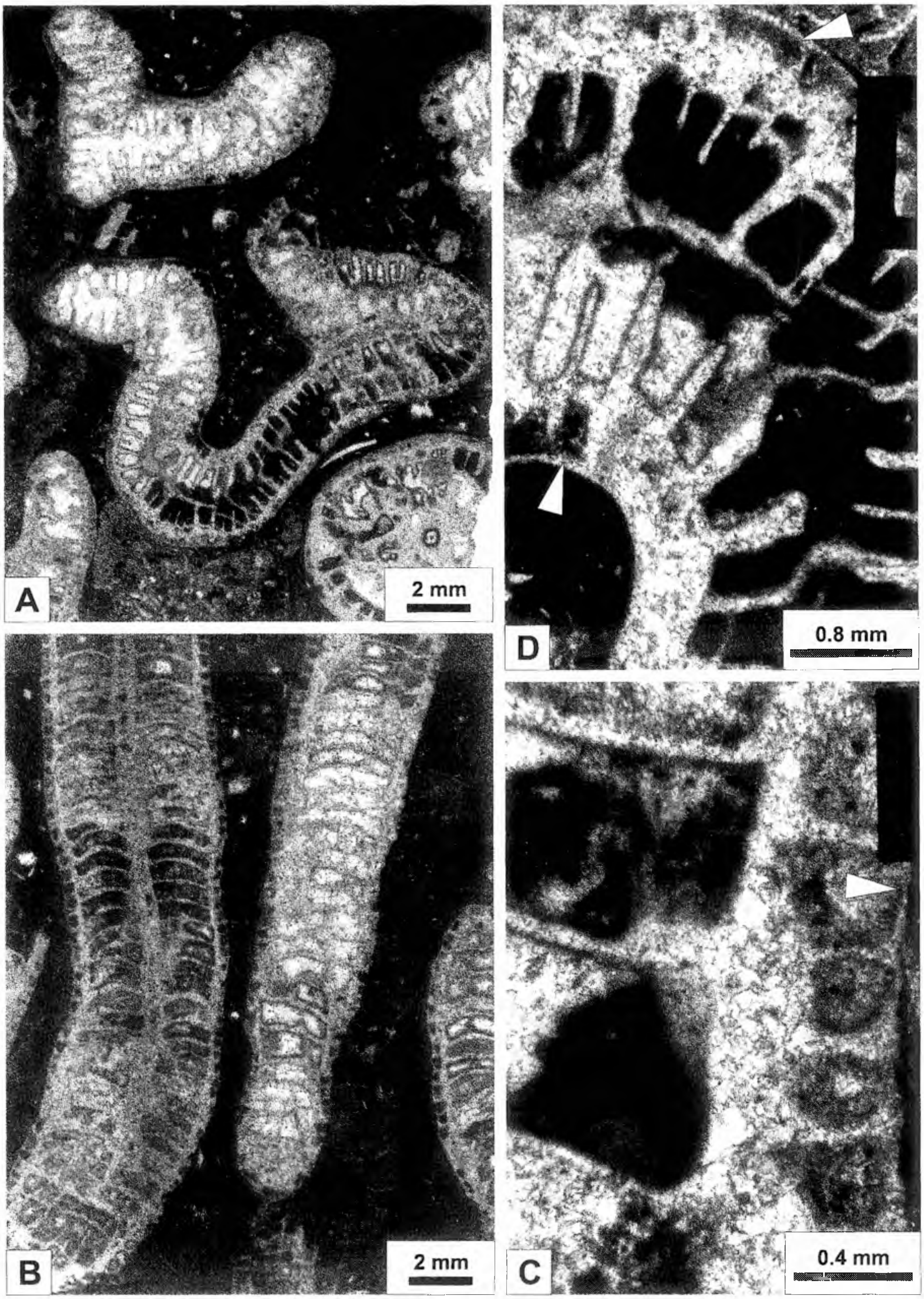

Fig. 19. **A–D.** *Parnassomeandra diacantoniae* Morycowa n.gen., n.sp.; type species and its holotype (UJ 158P 35): A – corallite series in transverse thin section (UJ 158P 35a); B – longitudinal section of the calicular series, showing a simple series on the right and two series connected laterally on the left; C – enlarged fragment of the calicular series in longitudinal section presented in B, showing thin epitheca (arrow), dissepimental stereome between epitheca and paratheca and tabuloid endothecal elements; D – magnified fragment of the calicular series from A showing septa of three size orders (S1, S2 and S3), septothecal and in places parathecal wall, as well as the very thin epitheca (arrows)

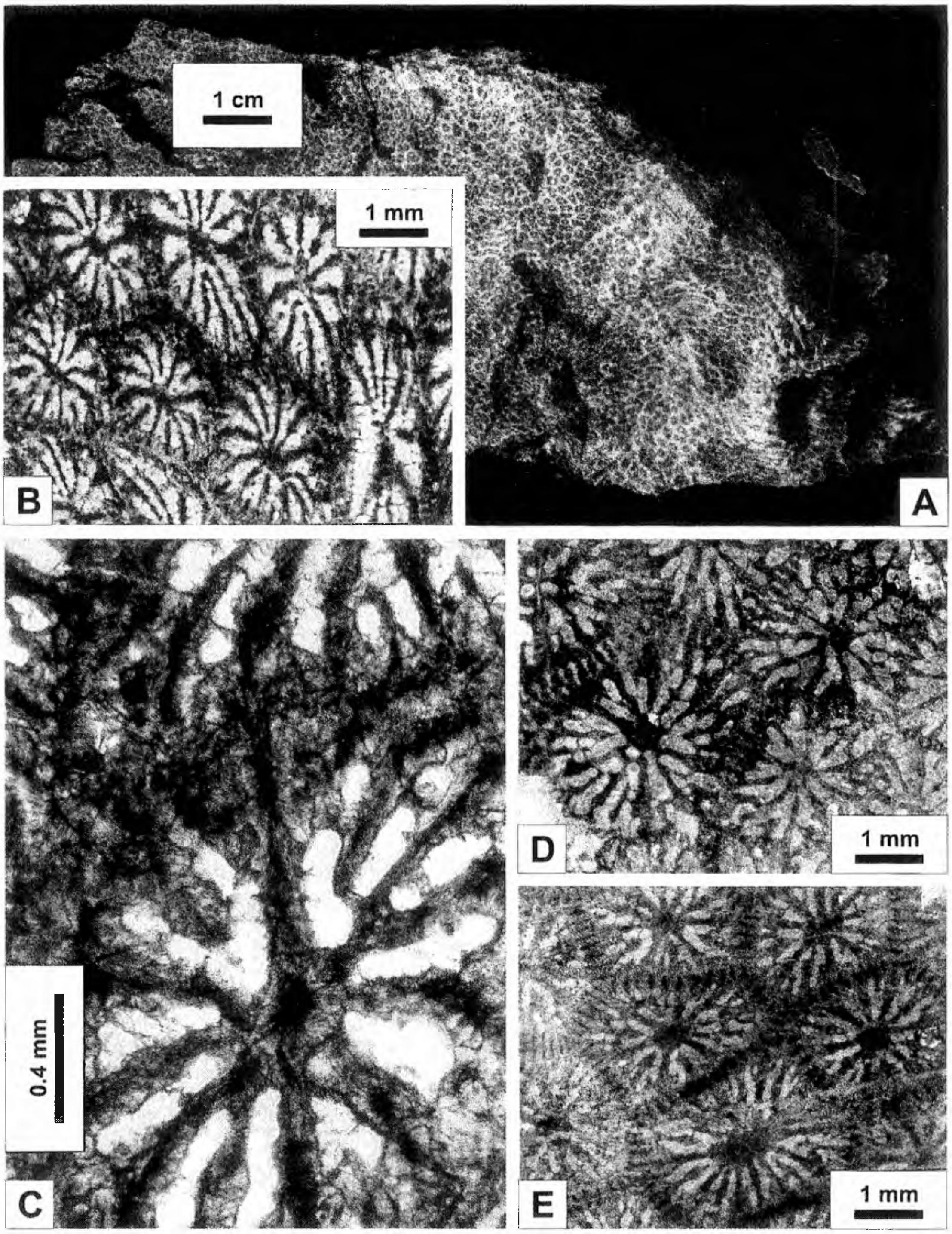

Fig. 20. **A–C.** *Actinastrea aequibernensis* (Hackemesser) (UJ 158P 83): A – calicular view of the colony; B – transverse and oblique thin section of corallites (UJ 158P 83a); C – enlarged fragment of the same thin section showing septothecal wall, styliform columella and disposition of septa; **D.** *Actinastrea major* Morycowa: Transverse thin section of corallites (UJ 158P 86a). Note characteristic type of septotheca (with "costules", after Alloiteau, 1947); **E.** *Actinastrea major* Morycowa (=*Actinastraea pseudominima major* Morycowa 1971), Romanian Carpathians, transverse thin section of the holotype (UJ. 124 83) showing the same type of septotheca and thickenings on the septa S2

Family ACTINASTREIDAE Alloiteau 1952

Genus *Actinastrea* d'Orbigny 1849
Type species: *Astrea Goldfussi* d'Orbigny 1849

Actinastrea aequibernensis (Hackemesser 1936)
Fig. 20 (A–C)

v1936. *Astrocoenia aequibernensis* Hackemesser: p. 74-75, pl. 8, figs 7-9.
1995. *Actinastrea aequibernensis* (Hackemesser): Löser & Raeder, p. 7.

Material: 1 colony: UJ 158P 84 and 2 fragments of colonies: UJ 158P 83 and 85; 7 thin sections: UJ 158P 84a-d, 85a-c.
Dimensions (in mm):

	UJ 158P 84	*A. aequibernensis* (Hack.) Hackemesser, 1936, coll. Renz, No.: D 6137
D UJ 158P 84	450×400	
H UJ 158P 84	400	
d cor	1.5-2.5 (2.7)	1.7-2.5
d cal		1.3-2-2.4
d l	1.3-2.2	1.3-1.5 (1.7)
c-c	1.5-2.5	
S	22-24	(20) 22-24
th S1 and S2 (wall zone)	ca 0.15	
d col	0.2-0.4	
th w	0.2-0.4	0.2-0.5
d tr (wall zone)	(150) 200-250 μm	

Description: One big well-preserved massive colony and one fragment of colony. Corallites polygonal in transversal section, connected by thin septotecal wall. Septa S1 et S2 are of the same thickness, narrowing slightly at their internal part. Columella small and mainly joined with septa S1 and often with S2. Septa S3 are 1/2 to 1/3 of S1 length, in some corallites weakly developed and visible only near the wall. They are usually free. Septal ornementation, endotheca and increase as in all species of the genus *Actinastrea*.
Remarks: *A. aequibernensis* (Hackemesser) differs from *A. pseudominima* (Koby) (Koby, 1897) in less regularly developed septal apparatus and a lack of regular thickening on the septa S2, near their inner ends (see Morycowa,1964, 1971; Morycowa & Masse, 1998, fig. 10: 1, 3).

A redescription of the group of species related to the widely distributed species *A. pseudominima* would clarify the problem of similarities and differences of the mentioned taxa.
Distribution:
Aptian/Albian – Greece, Helicon Mountains (Boeotia)
Cenomanian – Central Greece, Panourgias (= Dremisa) in Giona-Massif

Actinastrea major Morycowa 1971
Fig. 20 (D, E)

1971. *Actinastraea pseudominima major* Morycowa: p. 37-39, text-figs 13, 14; pl. 1, fig. 3; pl. 2, fig. 1.
1981. *Actinastraea pseudominima major* Morycowa: Turnšek & Mihajlović, p. 10, pl. 1, figs 1-5.
?1982. *Actinastraea pseudominima major* Morycowa: Liao, p. 155, pl. 1, fig.1a, b; pl. 2, fig.1.
?1994. *Actinastraea pseudominima major* Morycowa: Liao & Xia, p. 87, pl. 11, figs 3, 4.

Material: 1 colony: UJ 158P 86; 2 thin sections: UJ 158P 86a, b.
Dimensions (in mm):

	UJ 158P 86	Holotype: UJ 124P 5, Morycowa 1971
D	60×70	
H	ca 50	
d cal	1.5-2.8 (3)	(2) 2.2-2.7 (3)
c-c	3.0-3.5	(1.8) 2-3 (3.5)
S	24 (+ n S4 in the wall)	24 (+ n S4 in the wall)
th S1	0.2-0.5	0.25-0.3
den s (wall zone)	6-8/1	6-7/1
th w	0.2-0.4 (0.5)	0.2-0.5
d col	0.3-0.5	0.5-0.8
den "costules"	5/1	

Description: Massive cerioid colony. Corallites polygonal in transverse sections, connected by thick septotecal wall. Septa S1 reach the columella, S2 septa reach or almost reach the columella. Septa S2 have a characteristic thickening, occurring mainly near their inner ends. Twelve septa S3 are 1/2 to 3/4 of S1 length. Septa S3 joined by their internal ends with lateral surfaces of S2 septa. Columella subcircular or slightly elongated. In the septhothecal wall some S4 septa also occur. This type of abortive septa occuring only in the wall were named "costules" by Alloiteau (1954). Endotheca composed of thin subtabuloid elements and rarely of vesicular ones in the wall zone. Increase by corallite division.
Microstructure: Trabeculae thick, simple and branching, bigger in the wall zone and in the enlarged part of S2 septa.
Remarks: Because of differences in corallite diameters between *A. pseudominima* (Koby) and *A. pseudominima major* Morycowa, I suggest that this subspecies should be regarded as a separate species with the name *A. major*.

Taking into account the dimensions of corallites and the septal symmetry, the species closest to *A. major*, according to the literature, may be *Astrocoenia subornata* (d'Orbigny) (de Fromentel, 1857) and *Astrocoenia retifera* Stoliczka (1873). Hovewer, according to Alloiteau (see Morycowa, 1971, p. 39) *A. subornata* does not belong to the genus *Actinastrea*, and *A. retifera* needs a redescription.

Actinastrea major differs from *A. actinastrae* (Turnšek, in: Turnšek & Mihajlović, 1981) only in larger diameter of corallites (calice diameters in *A. actinastrae* = 1.2–2 mm). It should be mentioned here that *A. actinastrae* is very close or even identical to *A. bastidensis* Alloiteau (Alloiteau, 1954).
Distribution:
?Hauterivian–Early Aptian – Tibet, Xizang
Early Aptian – Romanian Carpathians, Rarău
Barremian–Early Aptian – Eastern Serbia, Zljebine, Rajčinica

Genus *Agrostyliastraea* Morycowa new genus
Type species: *Agrostyliastraea irregularis* n.gen, n.sp.

Etymology: Agrostylia – locality from which the studied corals were collected.
Diagnosis: Cerioid colony. Increase by division (simple and triple). Radial elements composed of thick trabeculae (simple and branching) disposed in series. Ornamentation granular. Internal septal edges of S1 and S2 with regular trabecular projections. Lonsdaleoid-like septa present. Wall septothecal, in young individuals trabeculothecal. Columella styliform. Two zones of endothecal dissepiments: outer – obliquely arranged, vesicular and inner – subtabuloid. Some trabecular spines occur on the vesicular endothecal elements.
Species included: *Actinastrea menabensis* Alloiteau (Alloiteau, 1958) from the Campanian–Mastrichtian of Madagascar should perhaps be included in the new genus *Agrostyliastraea*. As appar-

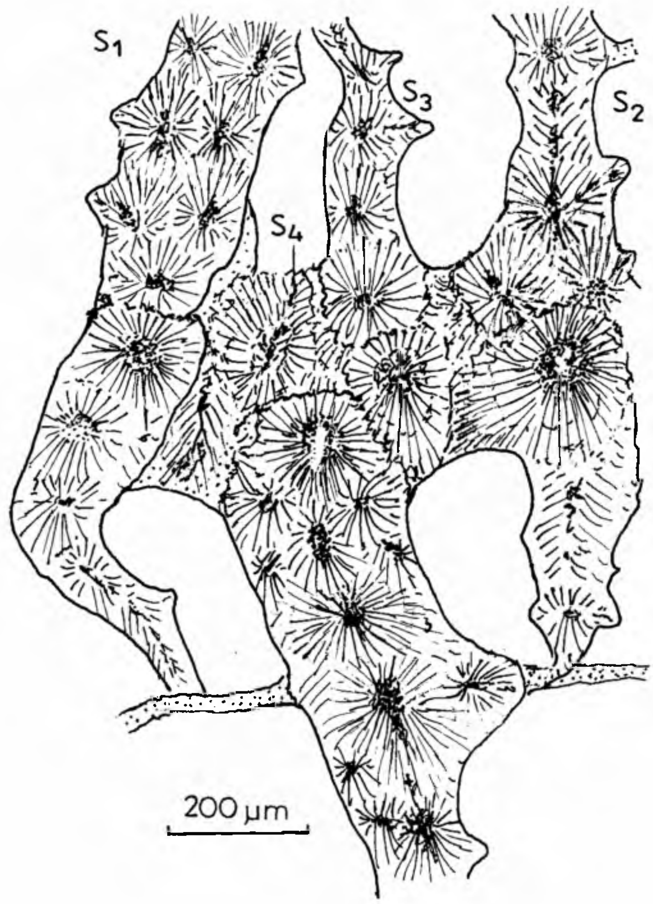

Fig. 21. *Agrostyliastraea irregularis* Morycowa n.sp.; holotype (UJ 158P 179). Scheme of skeleton microstructure. Note the thick trabecular calcification centres in the septa

ent from Alloiteau's description and figure (1958, p. 184, fig. 27) the endotheca of his specimens developed like in the specimens from Agrostylia and the lonsdaleoid septa are present, though rare.
Remarks: Corallite morphology, type of microstructure and the mode of increase allow *Agrostyliastraea* to be placed close to the *Actinastrea* (family Actinastreidae). Hovewer, the presence of lonsdaleoid septa and the type of endotheca distinguish *Agrostyliastraea* from all known species belonging to Actinastreidae.

It seems that the new genus *Agrostyliastraea* shows some morphological similarity to the genus *Pseudodiplocoenia* described by Alloiteau (1958) and supplemented by Roniewicz (1970). *Pseudodiplocoenia* is cerioid-subplocoid, increasing in the same manner as *Agrostyliastraea*. These two genera have radial elements composed of trabeculae arranged in series, granular ornamentation and lonsdaleoid septa (see Alloiteau, 1958, pl. 13, fig. 4; Roniewicz, 1970, p. 530, fig. 5) and also the same type of endotheca. According to these authors, *Pseudodiplocoenia* has radial-bilateral symmetry. The wall of *Pseudodiplocoenia* according to Alloiteau is archeothecal (term invalide, see Stolarski, 1995), and the diameters of trabeculae are small; according to Roniewicz it is composed of mural spines and the diameters of trabeculae are thick.

Agrostyliastraea irregularis Morycowa new species
Figs 21, 22 (A–D); 23 (A–D)

Holotype: UJ 158P 79, Figs 22 (A–D); 23 (A–D).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (region of Parnassos in Central Greece).
Etymology: Latin: *irregularis* – after the irregularly developed septal apparatus and shape of corallites.
Diagnosis: Diameter of corallites in transverse section from 3.5 to 4, rarely from 2.5 mm and during the division up to 6 mm. Three cycles of septa arranged in 6 equal or inequal systems. A few septa of the fourth cycles are present. Lonsdaleoid-like septa present. Columella small, styliform. Wall septothecal, in young individuals trabeculothecal. Density of dissepiments in wall zone (longitudinal section): 5–6 per 2 mm.
Material: 2 colony: UJ 158 79 and 80; 6 thin sections: UJ 158P 79a-e, 80a.
Dimensions (in mm):

	Holotype: UJ 158P 79
D (calicular surface)	20×30
D max	25×50
H	40
d circular	(2.5-3) 3.5-4.0
d during division	4.5-6
c-c	ca (2.5) 3-4.5
S	24 + n S4
d tr S1	(80) 100-200 µm
d tr (wall)	150-250 µm
th w	0.2-0.4
den end (wall zone, long. section)	5-6 (7)

Description: Massive cerioid colony and a fragment of colony with polygonal, rather shallow calices. Calicular edges sharp and thin. Three cycles of septa (S1–S3) arranged in 6 equal or inequal systems. In some corallites rare septa of the fourth cycle (S4) occur. The S1 septa reach or nearly reach the columella, septa S2 vary in length but mainly shorter than S1, the septa S3 thinner and shorter, up to half the length of septa S1. Internal septal edges of S1 and S2 with regular trabecular projections (Fig. 23C). The lonsdaleoid-like septa are developed on the endothecal elements forming pseudowall. The septal faces have sharply pointed granulations, in places regularly distributed. Wall septothecal, in young individuals trabeculothecal. Columella small, styliform, in transverse section rounded or oval or lamellar before axial division. Two zones of endothecal dissepiments: outer – vesicular and inner – subtabuloid. Some trabecular spines occur on the vesicular endothecal elements. Increase by division, during which two or three (rarely four) daughter corallites are formed within a parental individual. The wall of the new corallites was formed by the opposite septa of the parent corallite. During the corallite division the columella was elongated and joined to the opposite septa.
Microstructure: The septa consist of simple and branching thick-sized trabeculae inclined adaxially. The main trabeculae vary in diameter from 100 µm up to 200 µm in septa, in the wall zone they are vertical and larger, up to 250 µm, rarely more (Figs 21; 22B, C). In places only the septal main trabeculae give long lateral offsets which form granulations on the septal faces.

The internal septal edges of S1 and S2 have regular trabecular projections. The trabecular spines can be seen on the vesicular endothecal elements.

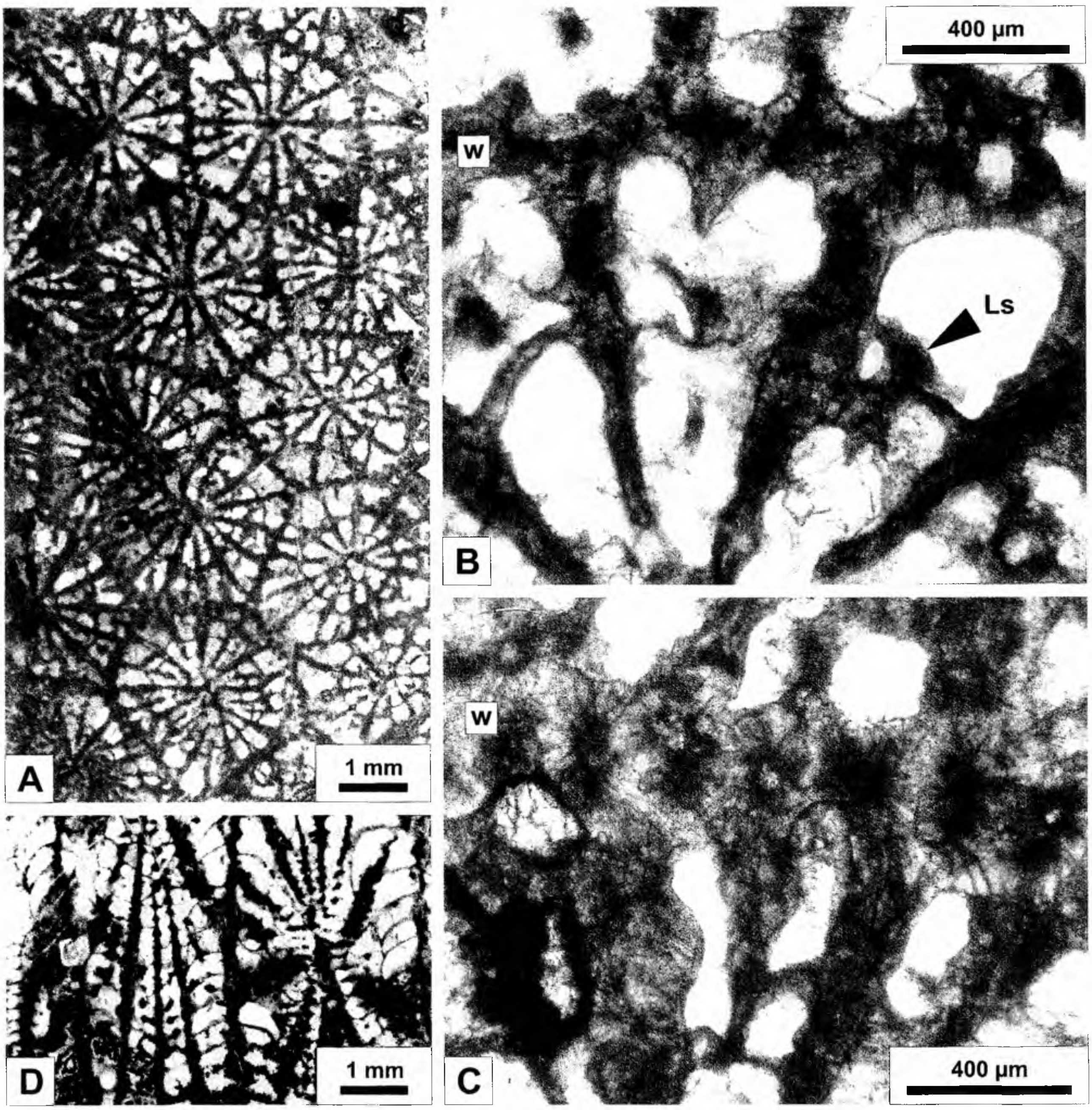

Fig. 22. **A–D.** *Agrostyliastraea irregularis* Morycowa n.gen., n.sp.; type species and its holotype (UJ 158P 179): A – transverse thin section showing polygonal shape of corallites with one in the state of division; B – enlarged portion of A, illustrating the septotheca (w) and septa of three size orders. Note the presence of some lonsdaleoid-like ones (arrow: ls); C – enlarged fragment of wall (w); D – longitudinal-slightly oblique section of corallites

Suborder ASTRAEOINA Alloiteau 1952
Family FAVIIDAE Gregory 1990

Genus *Favia* Oken 1815
Type species: *Madrepora fragum* Esper 1788

?*Favia cretacea* Morycowa new species
Figs 24 (A–F), 25 (A, B)

Holotype: UJ 158P 56; Figs 24 (A–F), 25 (A, **B**).
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (region of Parnassus in Central Greece)
Etymology: *cretacea* (Latin: cretaceus) – named after its occurrence in Cretaceous.
Diagnosis: Corallites closely spaced. Calices subcircular, oval, subpolygonal and irregularly elongated. Budding intracalicinal, peripheric without trabecular linkages. Costosepta compact, bicuneiform, nonconfluent, differentiated into 2 or 3 size orders, about 48–70 in number at diameters of ca 8–16 mm. Paliform lobes before septa S1 and S2. Columella papillar, well developed. Wall septothecal-parathecal, with, in places, few trabecular elements. Endotheca and exotheca vesicular. Microstructure of radial elements is variable in trabecular diameters and their arrangement.

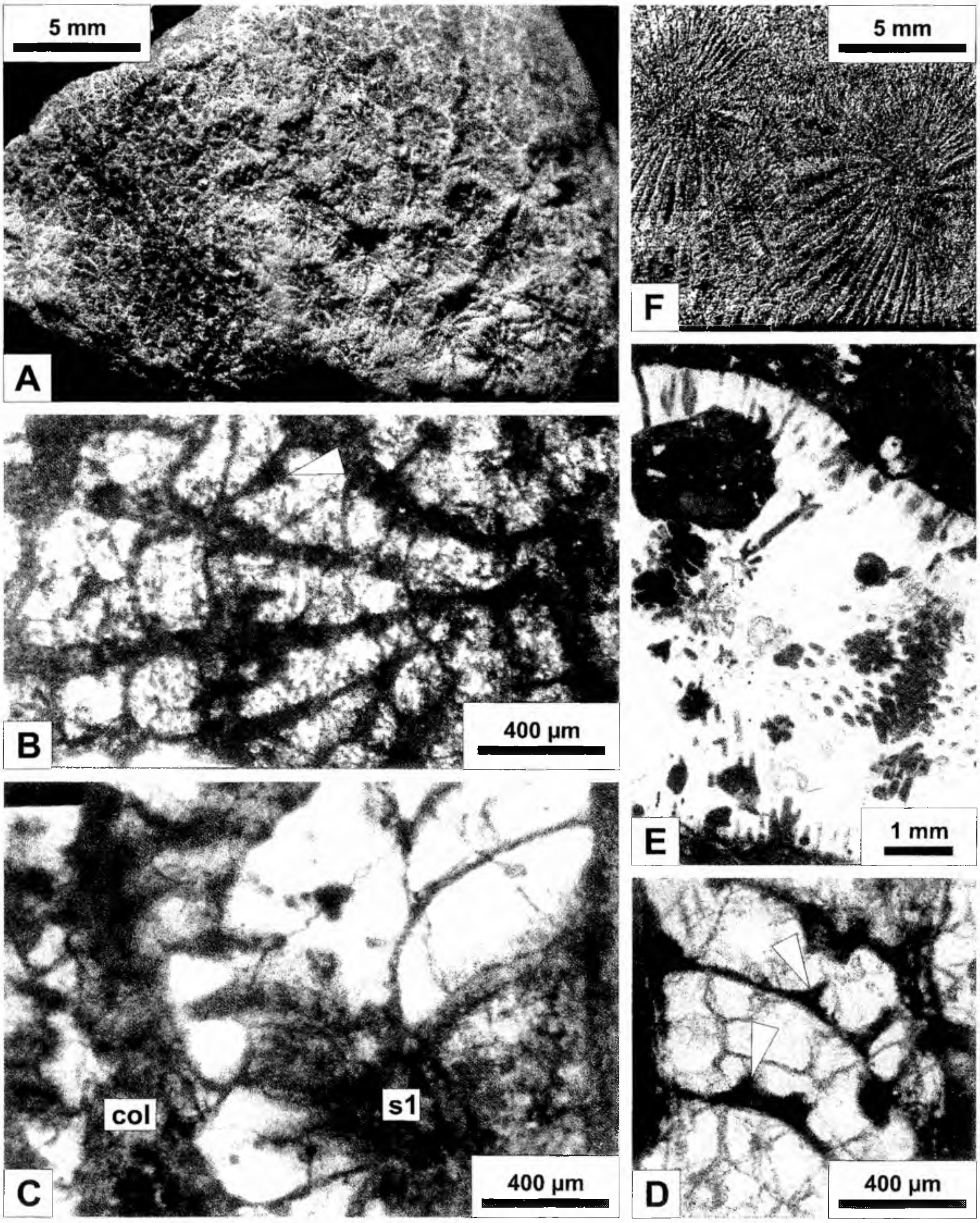

Fig. 23. **A–D.** *Agrostyliastraea irregularis* Morycowa n.gen., n.sp.; type species and its holotype (UJ 158P 79): A – calicular view of colony; B – enlarged fragment of corallite from Fig. 22A (UJ 158P 79a). Note the presence of the lonsdaleoid-like septa (arrow); C – enlarged portion of longitudinal section presented in Fig. 22D illustrating internal edges of S1 septa reaching the columella (col) and large vesicles; D – endothecal vesicles near wall zone of corallite in longitudinal thin section (UJ 158P 79c). Note trabecular spines on vesicular elements (arrows); **E.** *Pseudopolytremacis* cf. *spinoseptata* Morycowa, transverse thin section across fragment of branching colony (thin section: UJ 158P 105a); **F.** *Plesiofavia dubia* (de Fromentel), specimen: UJ 158P 57. Fragment of slightly abraded, calicular surface of colony

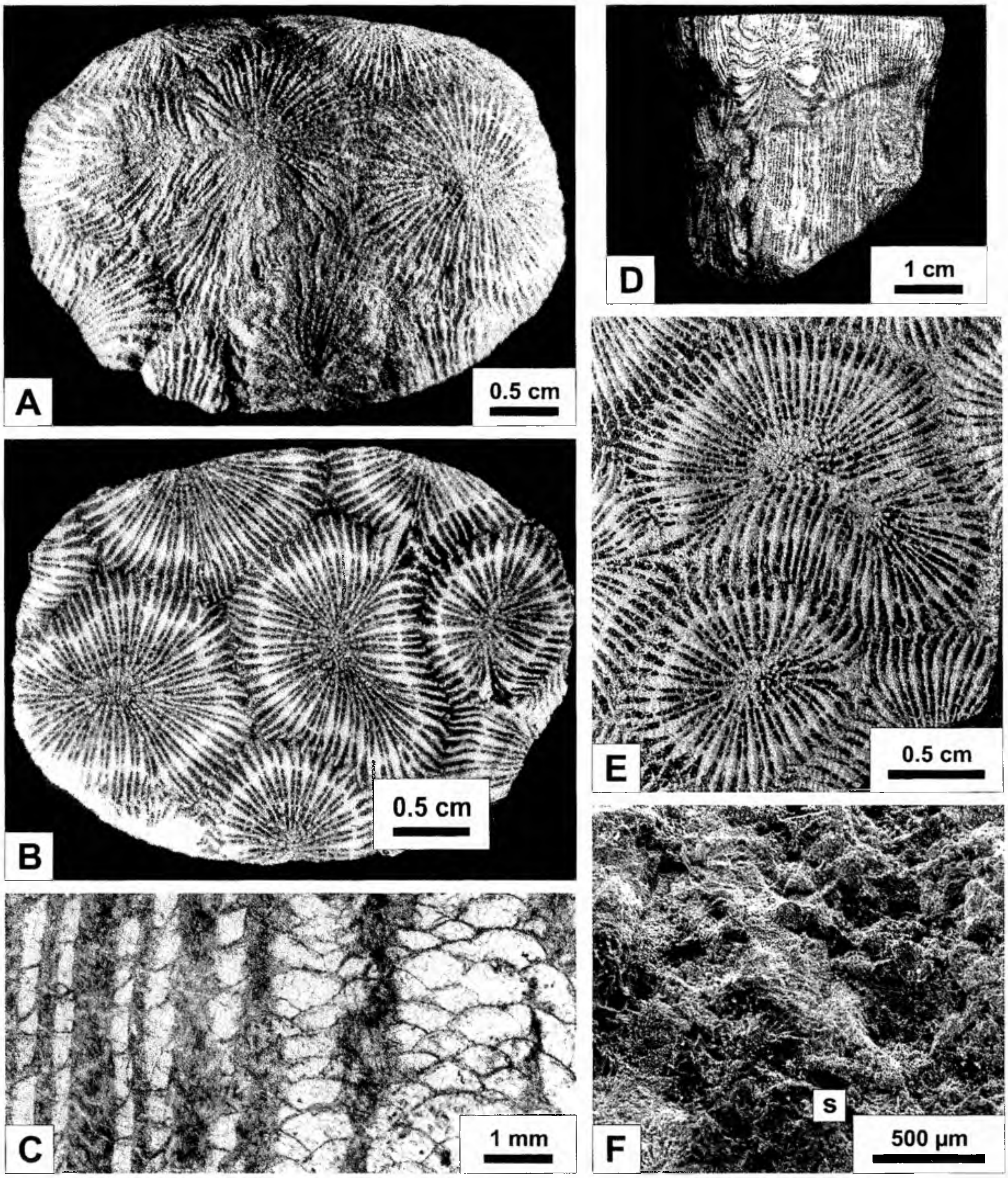

Fig. 24. **A–F.** ?*Favia cretacea* Morycowa n.sp., holotype (UJ 158P 56): A – abraded calicular surface showing shallow calices and narrow ambulacra between the corallites; B – transverse thin section of the same colony (UJ 158P 56a). Note subequal, nonconfluent costae; C – longitudinal thin section (UJ 158P 56b) showing vesicular endotheca; D – side view of colony; E – transverse polished and etched section showing a corallite elongated due to budding. Traces of septal denticles at the lower part of figure; F – SEM micrographs of septum (S) with traces of denticles

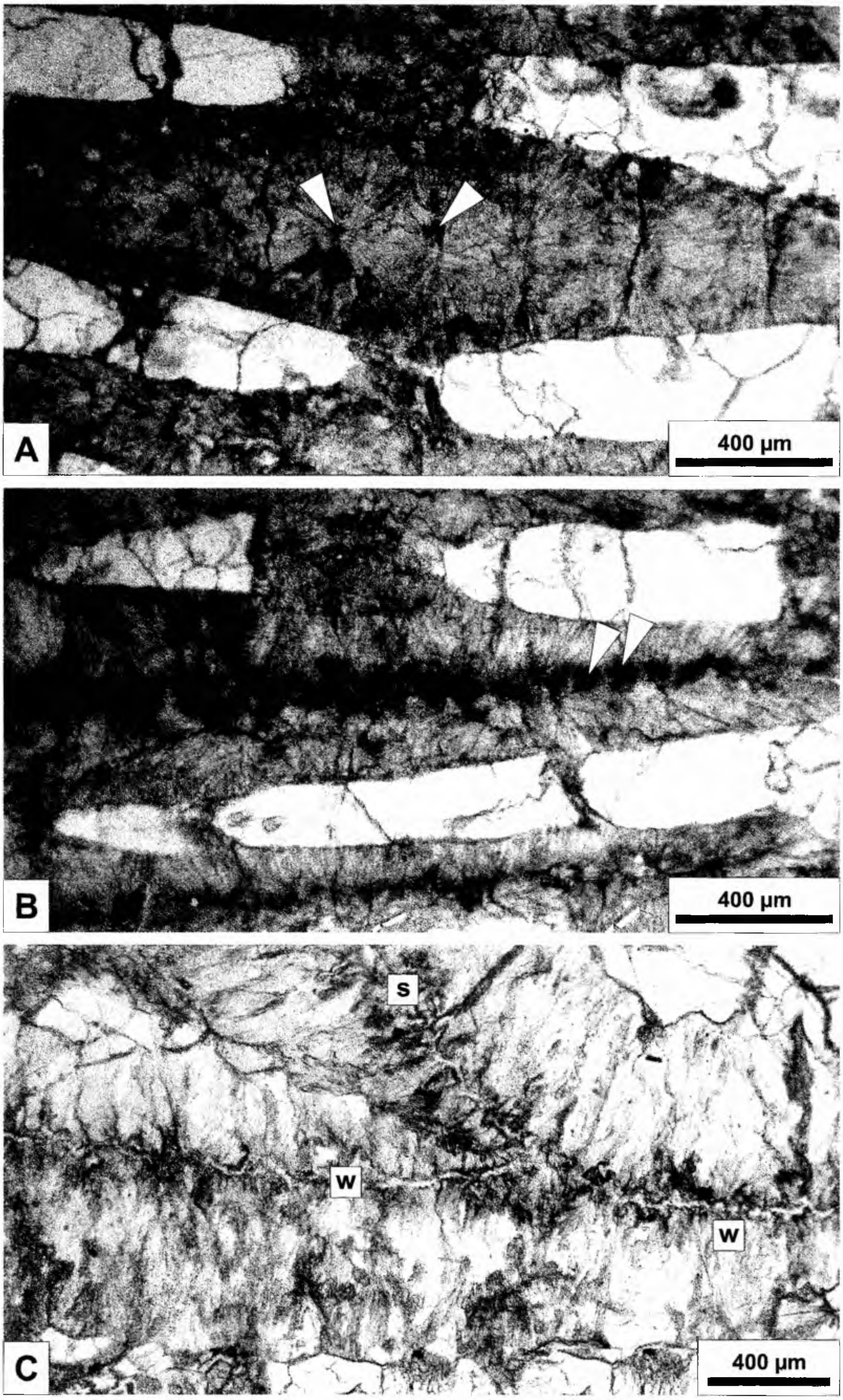

Fig. 25. A, B. ?*Favia cretacea* Morycowa n.sp., holotype (UJ 158P 56): enlarged fragments of Fig. 24B showing well separated septal calcification centres (arrows) in A, and linear densely arranged calcification centres (arrows) in B. In A and B the trabecular elements (rudimentary septa?) can be observed in the wall zone; **C.** *Preverastraea felixi* (Prever). Transverse section across the wall and septum. The structural continuation of the wall (w) and septum (s) clearly visible (thin section: UJ 158P 7a)

Trabeculae relatively thick, clearly separated, 200–350 µm, rarely up to ca 600 µm in diameter, in some septa they are small and closely packed (ca 3–5 cacification cetres par 1mm). Branching trabeculae occur, particularly in peripheric parts of radial elements.

Material: 1 colony: UJ 158P 56; 2 thin sections: UJ 158P 56a, b.

Dimensions (in mm):

	Holotype
D	39×40
H	ca 60
d cal circular	8-12×12-16
d cal elongated	to 20 (11×19)
c-c	ca 13-16
S	48-70
S (during budding)	to 80
den s	7-8/5 (4S1 and S2 + 3-4S3)
th S1 (in wall)	0.6-0.8 ((1))
th S2 (in wall)	0.3-0.4
d tr S1	200-350 (500) ((660)) µm
d tr S2	150-250 (400) µm
den cc in S1	(2) 3-5 (6-7) ((10))/1
width of exotheca	4-5
den denticles (distal edge of septa)	3-5/1
den end (wall zone)	5-6/2

Description: Colony massive plocoid. Corallites subcircular, elliptical, subpolygonal and irregularly elongated during budding. Budding intracalicinal, peripheric with indirect linkages. A new individual is initiated with the appearance of a new axis in lobate extension of an adult form. Calices shallow, separated from each other by a narrow depression. Costosepta compact, nonconfluent, differentiated into two or three size orders (Fig. 24B, E); they alternate in thickness but all are thickened near the wall. Septa S2 are of the same length as S1 or are slightly shorter. Paliform lobes before septa S1 and S2 septa. Distal edges of costosepta have teeth elongated across the septocostal plates (Fig. 24E, F). Lateral faces of costosepta covered with granulations arranged in rows subperpendicular to their distal edge or smooth because of a fibre thickening. Columella papillar, well developed. Wall septothecal-parathecal, with few trabecular elements. Endotheca abundant, formed of generally small vesicles, exotheca very narrow, vesicular.

Microstructure: Radial elements very well preserved. The trabeculae measured along the costoseptal mid-zone have variable dimensions: from 65 to 660 µm, most frequently from 200 to 350 µm. Some septa are formed of relatively thick trabeculae (Fig. 25A). Main trabeculae frequently have several small calcification centres (polycentric trabeculae) in their central zone. In some places, closely spaced calcification centres along septal mid-zone (Fig. 25B) can be observed. Lateral trabeculae are also present. Trabeculae of radial elements are arranged in an asymmetrical fan, with the costal part shorter than the septal .

Remarks: I decide to leave the species described here with reservation in the *Favia* genus.

The species described here as ?*Favia cretacea* n.sp. shows great variability in the type of septal microstructure in the same colony. Generally it is like that known in *Favia*, the only, till now, Cenozoic coral (e.g., Chevalier, 1971, 1961).

Favia shows morphological similarity to *Pseudofavia* created by Oppenheim (1930). The difference between *Favia* and *Pseudofavia* lies mainly in the type of budding. In *Favia* it is inter- and intracalicinal (see Chevalier, 1971), in *Pseudofavia* only intercalicinal.

Jurassic genus *Grandifavia* Babaev is not well documented (Babaev, 1964) but it seem to differ from *Favia* mainly in having smooth distal edges of radial elements and very large peritheca.

Genus *Plesiofavia* Alloiteau 1957
Type species: *Phyllocoenia dubia* de Fromentel 1884

Plesiofavia dubia (de Fromentel 1857)
Figs 23F, 26 (A–D), 35B

1857. *Phyllocoenia dubia* de Fromentel: p. 50, pl. 7, figs 3-4.
1884. *Phyllocoenia dubia* de Fromentel: de Fromentel, 1882b-1887, p. 554, pl. 157, fig. 2.
1957. *Plesiofavia dubia* (de Fromentel): Alloiteau, p. 122, pl. 8, fig. 11 (not Fig. 2).
1981. *Plesiofavia dubia* (de Fromentel): Turnšek & Mihajlović, p. 29, pl. 29, figs 1-4.

Material: 1 colony: UJ 158P 57, 1 fragment of colony: UJ 158P 58; 6 thin sections: UJ 158P 57a-e and 58a.

Dimensions (in mm):

	Holotype
D	60×70
H	ca 60
d (circular)	5-7
d elongated	(8) 10-12
c-c	6-12 (15)
S	(34) 36 (38-44)
den s	7-8/5 (4S1 + 3-4S2)
th S1 (in wall)	0.5-0.7
th S2	0.3-0.4
d tr	(150) 200-350 (400) µm
den tr	3-5/1
den dentations	3-4(5)/1

Description: Colony massive plocoid. Corallites subcircular, oval, subpolygonal and irregular, elongated during the budding. Budding intracalicinal, peripheric without trabecular linkages. Calices separated from each other by narrow depression. Costosepta compact, nonconfluent, differentiated mainly in 2, rarely in 3 size orders. They are subequal in thickness in the wall zone. About 14–18 septa S1 reach the center of corallites. Distal edges of costosepta regularly denticulate. Lateral faces of costosepta covered with granulations. Columella papillar, well developed, formed by trabecular projections of the internal septal edge of the long septa. Wall septothecal-parathecal. Rare synapticulae occur in the wall zone. Endotheca and exotheca vesicular. Exotheca rather narrow.

Microstructure: The costoseptal trabeculae measured in radial direction have distinctly variable dimensions, from mainly 150 to 400 µm, most frequently from 200 to 350 µm. In places, the calcification centres are closely spaced (Fig. 26C). In more axial part of septa and in the costal ones the trabeculae seem to be disposed subhorizontaly (Fig. 26C, D). Lateral trabeculae occur irregularly.

Remark: The species seems to be morphologically related to the species described by de Fromentel (1857) as *Phyllocoenia dubia*.

Alloiteau (1957, p. 122), on the basis of the type of the septal microstructure and ornamentation, placed the *Phyllocoenia dubia* in Faviidae. Later Turnšek (in Turnšek & Mihajlović, 1981) identified the specimen from Serbia as *Plesiofavia dubia* and placed it in the family Haplaraeidae on account of the porous radial elements and presence of the synapticulae.

Unfortunately, the microstructure of the specimens *P. dubia* was presented neither by Alloiteau nor by Turnšek.

The species identified here as *P. dubia* shows varied septal microstructure in the same colony. Generally it is like that known in Faviidae (e.g., Chevalier, 1961, 1971). So, I decide to leave the species in this family.

Distribution:
Hauterivian – France, Gy-l'Evêque
Barremian–Early Aptian – Eastern Serbia (Zljebine)

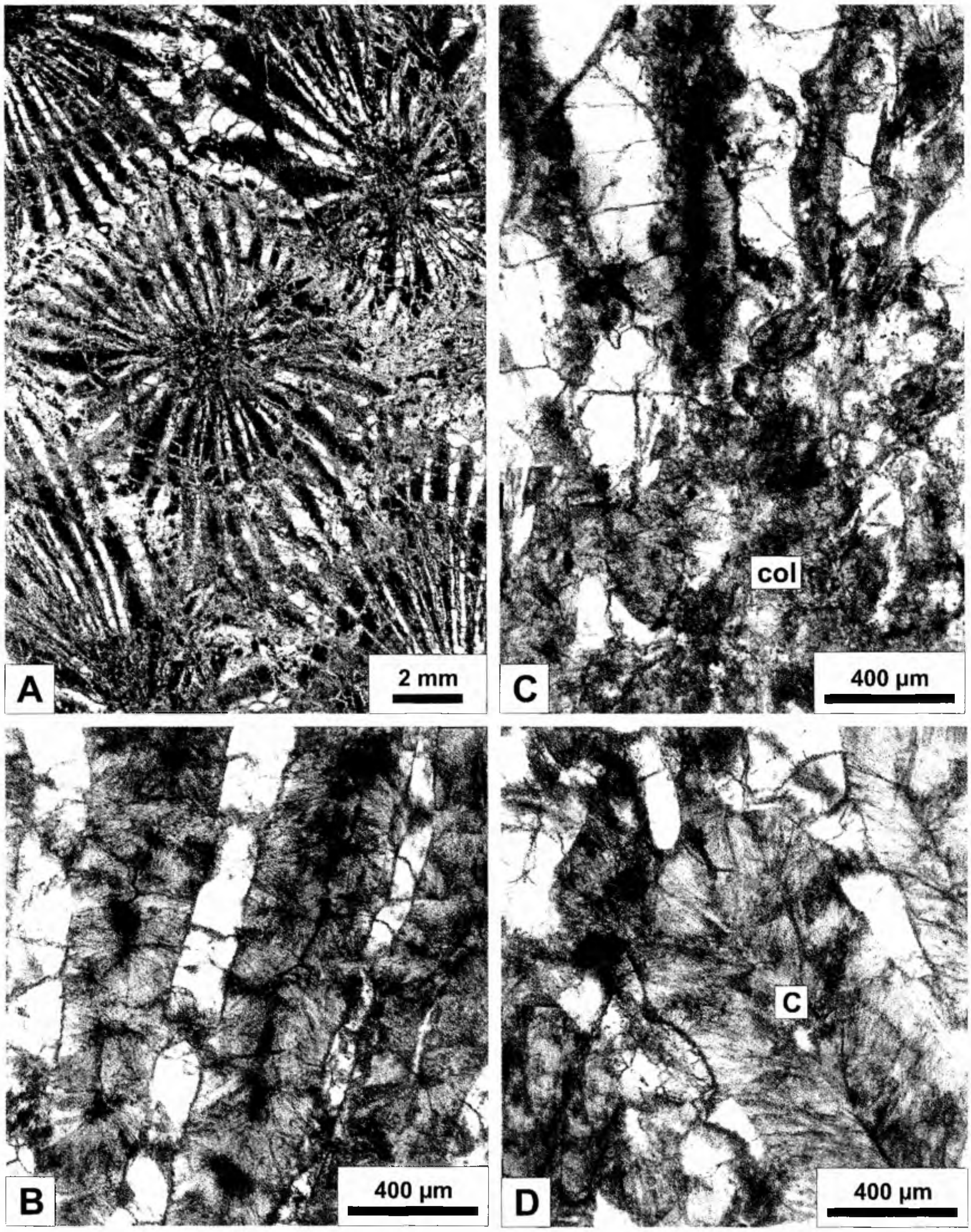

Fig. 26. **A–D.** *Plesiofavia dubia* (de Fromentel) (thin section – UJ 158P 57a): A – transverse thin section of corallites; B–D – enlarged fragments from A: B – fragments of septa; C – axial part of corallite (col-columella); D – fragment of costae (C). Note subdistinct calcification centres in septa and regular mid-septal line in costae, with fibres arranged almost parallelly

Genus *Myriophyllia* d'Orbigny 1849
Type species: *Meandrina rastellina* Michelin 1843

Myriophyllia propria Sikharulidze 1979
Fig. 27 (C–G)

1979a. *Myriophyllia propria* Sikharulidze: p. 14-16, pl. I, fig. 2; pl. 7, fig. 1a-b.
1995. *Myriophyllia propria* Sikharulidze: Löser & Raeder, p. 45.
1996. *Myriophyllia propria* Sikharulidze: Császár & Turnšek, p. 434, fig 10: 27.
?1997. *Myriophyllia propria* Sikharulidze: Baron-Szabo: p. 54, pl. 4, fig. 6.
1999. *Myriophyllia propria* Sikharulidze: Baron-Szabo & Gonzáles-León, p. 469, fig. 2b.

Material: 2 specimens: UJ 158P 41 and 42; 5 thin section: UJ 158 41a, b, 42a-c.

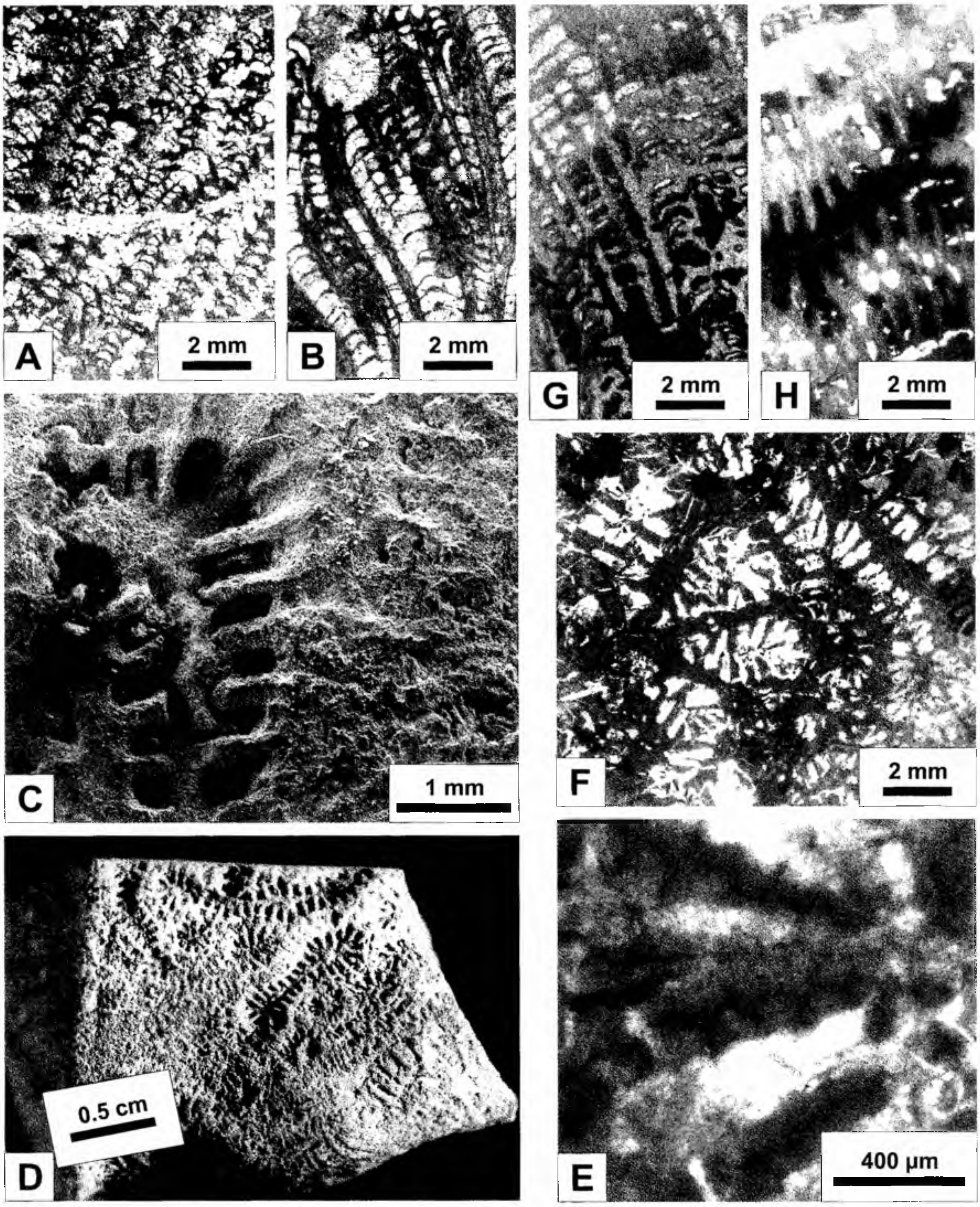

Fig. 27. A, B. *Diplogyra minima* Morycowa & Marcopoulou-Diacantoni, holotype (UJ 158P 30): A – transverse thin section of the corallite series (UJ 158P 30a) presented in Morycowa & Marcopoulou-Diacantoni, 1997, pl. 7, fig. 4; B – longitudinal section showing development of endo- and exotheca (UJ 158P 30b); **C–G.** *Myriophyllia propria* Sikharulidze (specimen – UJ 158P 41): C – a part of upper surface of colony with fragment of corallite series. Note the presence of lamellar columella; D – distal view of colony fragment; E – transverse thin section showing faint traces of septal microstructure as well as septal granulations (thin section UJ 158P 41a); F – the same thin section showing arrangement of corallite series; G – longitudinal thin section (UJ 158P 41b) showing tabuloid endothecal elements; **H.** *Eugyra* aff. *arasensis* Alloiteau, transverse thin section across the series (UJ 158P 40a)

Dimensions (in mm):

	UJ 158P 41	UJ 158P 42	Sikharulidze, 1979a
D	50×70	35×60	
H	35	ca 50	
col-col	(1.5) 2-3 (3.5)		2-2.5
d	1.5-3.5		2.5-3
den s	12-14/5		14/5
S (monocentric calice)	6-9 S1 + nS2		
den end	11-13/5	12-14/5	

Description: Two massive meandroid colonies. Flexuous and straight parallel series, open and closed. Collines tholiform. Monocentric, isolated corallites and distinct or subdistinct corallite centres are observable in the series. Costosepta in series mainly alternating in size. Some inner ends of septa S1 are terminated in the form of paliform lobes. In some isolated calices a few costosepta of third size order are to be observed. Columella small, styliform and rarely lamellar ("septes de valle") apparent only in places. Septothecal wall. Endotheca consists of tabuloid dissepiments.

Microstructure: poorly preserved.

Remarks: *M. propria* resembles *M. alternans* Sikharulidze (Sikharulidze, 1977) from the Lower Barremian of Georgia and Lower Aptian of Romania (Morycowa, 1971), as well as *M. borrachensis* Wells from the Upper Aptian–Lower Albian in Northeastern Venezuela (Wells, 1944). It differs from the former in larger calicinal series and higher density of costosepta (in *M. altenans*: col-col = 3–3.5, den s = 11/5 mm) and from the latter in denser radial and endothecal elements (in *M. borrachensis*: den s: 7–9/5 mm, den end: 6/5 mm).

M. propria described by Baron-Szabo (1997) from the Lower Aptian of Kalkalpen differs from the typical specimen in considerably denser radial elements (17–23/5 mm).

Distribution:

?Hauterivian – Hungary, the Mecsek Mountains
Late Barremian–Middle Albian – Mexico, Sonora
Early Aptian – Austria/Germany, Helveticum, Allgäuer Schrattenkalk
Aptian/Albian – Greece, Boeotia
Albian – Georgia (Caucassus)

Genus *Eugyra* de Fromentel 1857
Type species: *Eugyra Cotteaui* de Fromentel 1857

Eugyra aff. *arasensis* Alloiteau 1946-47
Fig. 27H

1946-47. *Eugyra arasensis* Alloiteau: p. 197-199, text-fig. 2, pl. 2, fig. 4.
1994. *Eugyra arasensis* Alloiteau: Reig Oriol, p. 35, fig. 1a.
1997. *Eugyra* aff. *arasensis* Alloiteau: Morycowa & Marcopoulou-Diacantoni, p. 252.

Material: 1 fragment of colony: UJ 158P 40; 2 thin sections: UJ 158P 40a, b.

Dimensions (in mm):

	UJ 158P 40	Alloiteau, 1946-47
col-col	(2) 2.5-3.5 (4-4.5)	3-5
d	1.5-3.5	2.5-3
den s	10-13 (S1 + S2)/5	10 (5S1 + 5S2)/5
den end	10-13/5	

Description: Fragment of massive, meandroid colony. Series parallel and flexuous; collines thectiform. Costo-septa differentiated generally into 2 orders. Para-septothecal wall. Endotheca composed of abundant dissepiments, oblique in the wall zone and subtabuloid and slightly convex in the central part of the series.

Remarks: It should be mentioned that the dimensions of the specimen described here have been measured only on the small fragment of the colony (D: 20 × 15 mm).

Eugyra arasensis is very close to *E. besavotrensis* Alloiteau from the Albian of Madagascar (Alloiteau, 1958) and to *Eugyra*? *magnus* Eguchi (Eguchi, 1951) from the Lower Cretaceous of Japan. Although all of them have similar width of the series, the density of costosepta in *Eugyra arasensis* is higher than in the species mentioned above (in *E. besavotrensis*: den s: 7(8)/5 mm, den end: 6–7/5 mm, in *E.*? *magnus*: den s: 5–7/5).

Distributions:

Aptian – North Spain
Late Aptian (Gargasian) – North Spain

Genus *Diplogyra* Eguch, 1936
Type species: *Diplogyra lamellosa* Eguchi 1936

Diplogyra minima Morycowa et Marcopoulou-Diacantoni 1997
Figs 27 (A, B)

1997. *Diplogyra minima* Morycowa & Marcopoulou-Diacantoni, p. 262-263, text-fig. 10a-c, pl. 7, figs 4-7.

Material: 1 colony: UJ 158P 30, 2 fragments of colonies: UJ 158P18 and 42; 4 thin sections: UJ 158P: 30a, 18a, b, 42a.

Dimensions (in mm):

Diameters of the closely related species of the genus *Diplogyra*

	Diplogyra minima	*D. lamellosa* Eguchi, 1936	*D. lamellosa eguchi* Morycowa, 1971	*D. subplanotabulata* Sikharulidze, 1985
D No. 30	50×60			
H No. 30	53			
col-col	1.5-2.0 (2.5)	4-5	(2) 2.5-3.5 (4.5)	2-3.5
den s	3-4/2	4/2	3-4 (5)/2	3-4/2
den end	4-6/2	?	2-2.5/2	4-5/2

Remarks: Two specimens (No.18 and 30) from Agrostylia were described in Morycowa and Marcopoulou-Diacantoni (1997). The third, small specimen (No. 42) was collected after the publication of that article.

In the diagnosis of this species given by Morycowa and Marcopoulou-Diacantoni (1997, p. 262) one sentence was incorrectly worded, moreover, during the printing the heading concerning *Diplogyra minima* and the diameters of a closely related species were separated by figs 7, 8, 9, from the dimensions concerning *Preverastraea*. Therefore, I present the corrected diagnosis of *Diplogyra minima.*

Emended diagnosis: Meandroid colony. Generally long series. Collines with narrow ambulacra. Series averaging 1.5 to 2.0, rarely to 2.5 mm in width. Density of costosepta: 3–4 per 2 mm and density of endothecal tabuloid elements: 4–6/2 mm.

Genus *Eohydnophora* Yabe et Eguchi 1936
Type species: *Eohydnopora tosaensis* Yabe et Eguchi 1936

Eohydnophora cf. *crassa* (de Fromentel 1862)

v1862a. *Hydnophora crassa* de Fromentel: p. 430.
v1875. *Hydnophora crassa* de Fromentel: de Fromentel, 1862b-1887, p. 471, pl. 115, fig. 2.

v1897. *Hydnophora crassa* de Fromentel: Koby, p. 44, pl. 2, fig, 12, 12a; pl. 8, fig. 3.
1905b. *Hydnophora crassa* de Fromentel: Angelis d'Ossat, p. 25, pl. 2, fig. 30A.
1994. *Eohydnophora* cf. *crassa* (de Fromentel): Masse & Morycowa, p. 438, pl. 1, fig. 6.
1995. *Eohydnophora* cf. *crassa* (de Fromentel): Abdel-Gawad & Gameil , p. 16, pl. 16, fig. 4.
1997. *Eohydnophora* cf. *crassa* (de Fromentel): Morycowa & Marcopoulou-Diacantoni, p. 252.
?1997. *Eohydnophora* cf. *crassa* (de Fromentel): Gameil, p. 350-351, pl. 1, fig. 2; text-fig. 3b.

Material: 1 fragment of colony: UJ 158P 59, 1 thin section: UJ 158P 59a.
Dimensions (in mm):

l col	2.5-4.5 (5)
col-col	2.0-4
den s	2-3/2
den end	3-5/2

Remarks: Morycowa & Marcopoulou-Diacantoni (1997) identified this specimen as *Eohydnophora crassa* (de Fromentel). However, taking into account poor state of preservation of this small fragment of colony, the identification has been corrected into *Eohydnophora* cf. *crassa.*
Distribution:
Barremian – France, Provence (Orgon)
Early Aptian – France, Provence (Vaucluse: Sault)
Urgonian – France, Jura (Doubs: Mortau)
Urgonian – Switzerland: Alps (Helvetic zone; "Kasernalp")
Barremian–Aptian – Italy, Capri
Cenomanan – ?Egypt (Sinai, G. Mokattab)
This species is also known in Aptian sediments in Prebalkan in Bulgaria (Zlatarski, 1968).

Family MONTLIVALTIIDAE Dietrich 1926

Genus *Clausastrea* d'Orbigny 1849
Type species: *Clausastrea tesselata* d'Orbigny 1849

Clausastrea magna Reig Oriol 1997
Fig. 28 (A, B)

1997. *Clausastrea magna* Reig Oriol: p. 14-15, pl. 3, fig. 6.

Material: 1 colony: UJ 158P 52; 1 fragment of colony: UJ 158P 53; 3 thin sections: UJ 158P 52a-c.
Dimensions (in mm):

D	40×80
H	ca 90
d	(10) 15-18 (20)
c-c	12-18
S	24-28 (S1-S3 + nS4)
den s	4-5/5
th S1 (outer corallite zone)	ca 1-1.2
th S2 (outer corallite zone)	ca 0.8-1
den end	9-10/5

Description: Massive, subthamnasterioid – cerioid colony. Calices elliptic or subcircular. Septa subconfluent and confluent, rarely nonconfluent. Septa S1 and S2 mostly similar in thickness, with considerably thinner younger septa irregularly occurring between them. About 12 septa reach the centre of corallites. Endotheca consists of large tabuloid elements, convex between two corallites and concave in the central part of corallites.Vesicular dissepiments occur in places in the outer zone of corallites.
Remarks: Our species closely resembles to *C. alloiteaui suhindolensis* Zlatarski, known from the Aptian of Bulgaria (Zlatarski, 1967), but differs from it in much larger diameters of corallites and in slightly lower number of radial elements.
Distribution:
Albian – Spain, Catalonia (Tarragona Province)

Genus *Peplosmilia* Milne Edwards et Haime 1850
Type species: *Peplosmilia austeni* Milne Edwards et Haime 1850

Peplosmilia fromenteli Angelis d'Ossat 1905
Fig. 29 (A–E)

1905a. *Peplosmilia Fromenteli* Angelis d'Ossat: 242 (74), pl. 17 (4), fig. 6a-g.
1937. *Peplosmilia Fromenteli* Angelis d'Ossat: Bataller, p. 261-262, text-figs 1-4.
1947. *Peplosmilia Fromenteli* Angelis d'Ossat: Bataller, p. 105.
1951. *Peplosmilia fromenteli* Angelis d'Ossat: Marković, p. 192, pl. 4, fig. 5.
1974. *Axosmilia fromenteli* (Angelis d'Ossat): Turnšek & Buser, p. 99, pl. 10, fig. 1.
1981. *Peplosmilia fromenteli* Angelis d'Ossat: Turnšek & Mihajlović, p. 23, pl. 21, figs 1-6.
1987. *Peplosmilia fromenteli* Angelis d'Ossat: Kuzmicheva, p. 231, pl. 2, fig. 4.
1991. *Peplosmilia fromenteli* Angelis d'Ossat: Reig Oriol, p. 15-16, pl. 4, figs 7, 8.
1992. *Peplosmilia fromenteli* Angelis d'Ossat: Turnšek *et al.*, p. 213, pl. 6, figs 1-3.
1994. *Peplosmilia fromenteli* Angelis d'Ossat: Liao & Xia, p. 165-166, pl. 61, figs 9-11.
1995. *Peplosmilia fromenteli* Angelis d'Ossat: Abdel-Gawad & Gameil, p. 15, pl. 14, figs 2-5.
1996. *Peplosmilia fromenteli* Angelis d'Ossat: Baron-Szabo & Steuber, p. 15, pl. 7, fig. 4.
1997. *Peplosmilia fromenteli* Angelis d'Ossat: Baron-Szabo, p. 72-73, pl. 8, fig. 1.

Material: 1 specimen: UJ 158P 54, 5 thin sections: UJ 158P 54a-e.
Dimensions (in mm):

D	22×30
H	ca 30
S	ca 90
den s	6-8/5
den c	8-10/5
th S1	0.4-0.6
th S4	ca 0.15
den end (long. sect., wall zone)	5/5

Description: Corallum short, subcylindrical, oval in transverse section, with broad base. Calice oval. Lateral surface is costate, thin epitheca only partly preserved. Costosepta compact, developed in four complete cycles and fifth incomplete, arranged in three size orders. Two first orders subequal, reach or almost reach the columella, third order shorter, about half the length of septa S1. Fourth order septa are 1/3 the length of S1 and fifth order septa are thinner and shorter and not fully developed. Wall parathecal, not well preserved. Columella lamellar, connected with one long septum S1. Endothecal elements in the wall region strongly convex and in the centre large, subtabuloid.
Microstructure: Microstructure of skeleton is not well preserved. However, in places in transverse thin section there are dark spots

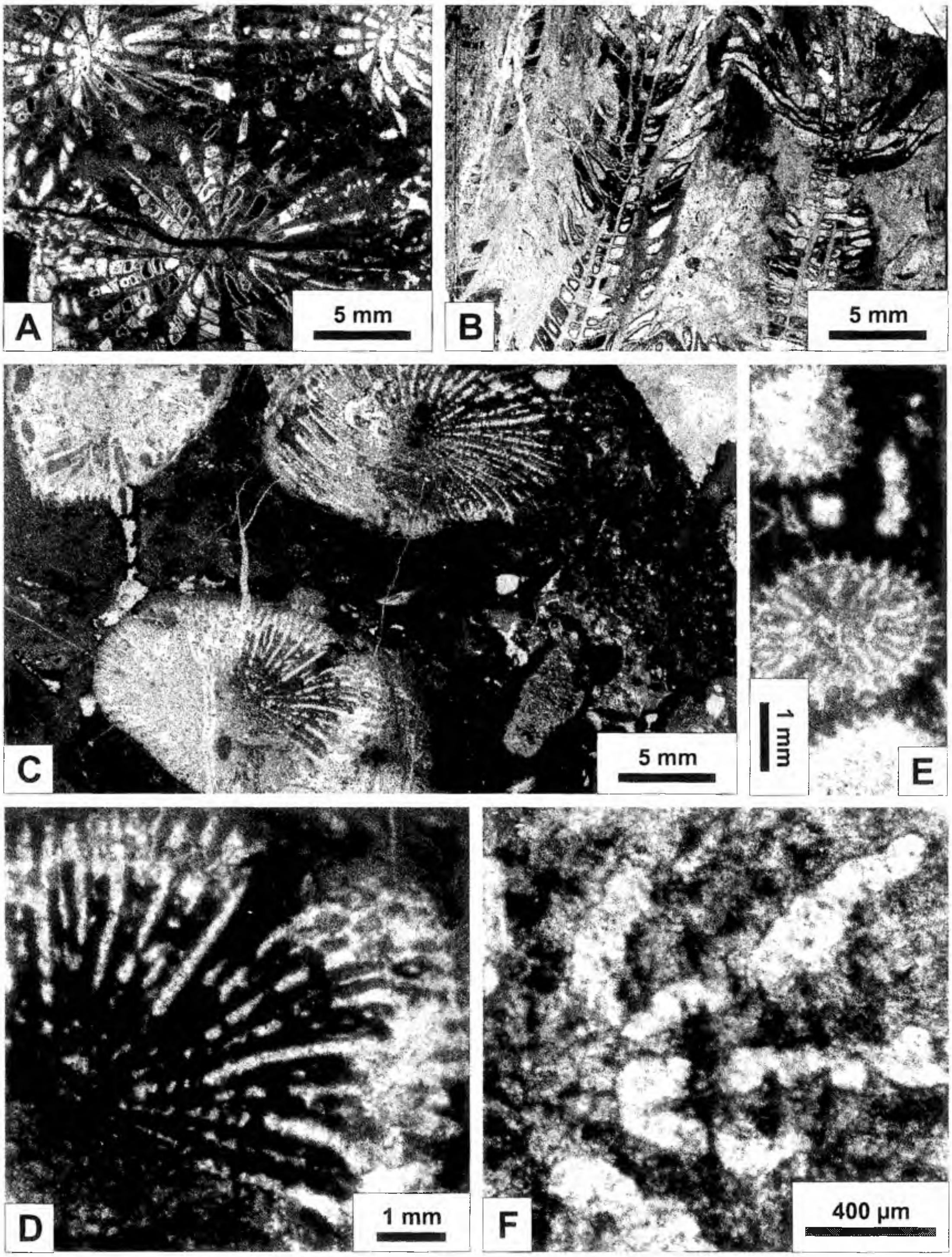

Fig. 28. **A, B.** *Clausastrea magna* Reig Oriol: A – transverse thin section (UJ 158P 52a); B – longitudinal section (thin section UJ 158P 52b) showing tabuloid endotheca; **C, D.** *Latomeandra minor* Reig Oriol: C – transverse section across fragment of phaceloid colony (UJ 158P 91a); D – enlarged detail of C showing porous radial elements; **E.** *Calamophylliopsis* sp. Transverse section (thin section: UJ 158P 63a); **F.** *Tricassastraea* cf. *parnassensis* Alloiteau. Transverse section (thin section: UJ 158P 17a) showing traces of septal microstructure and ornamentation as well as styliform columella

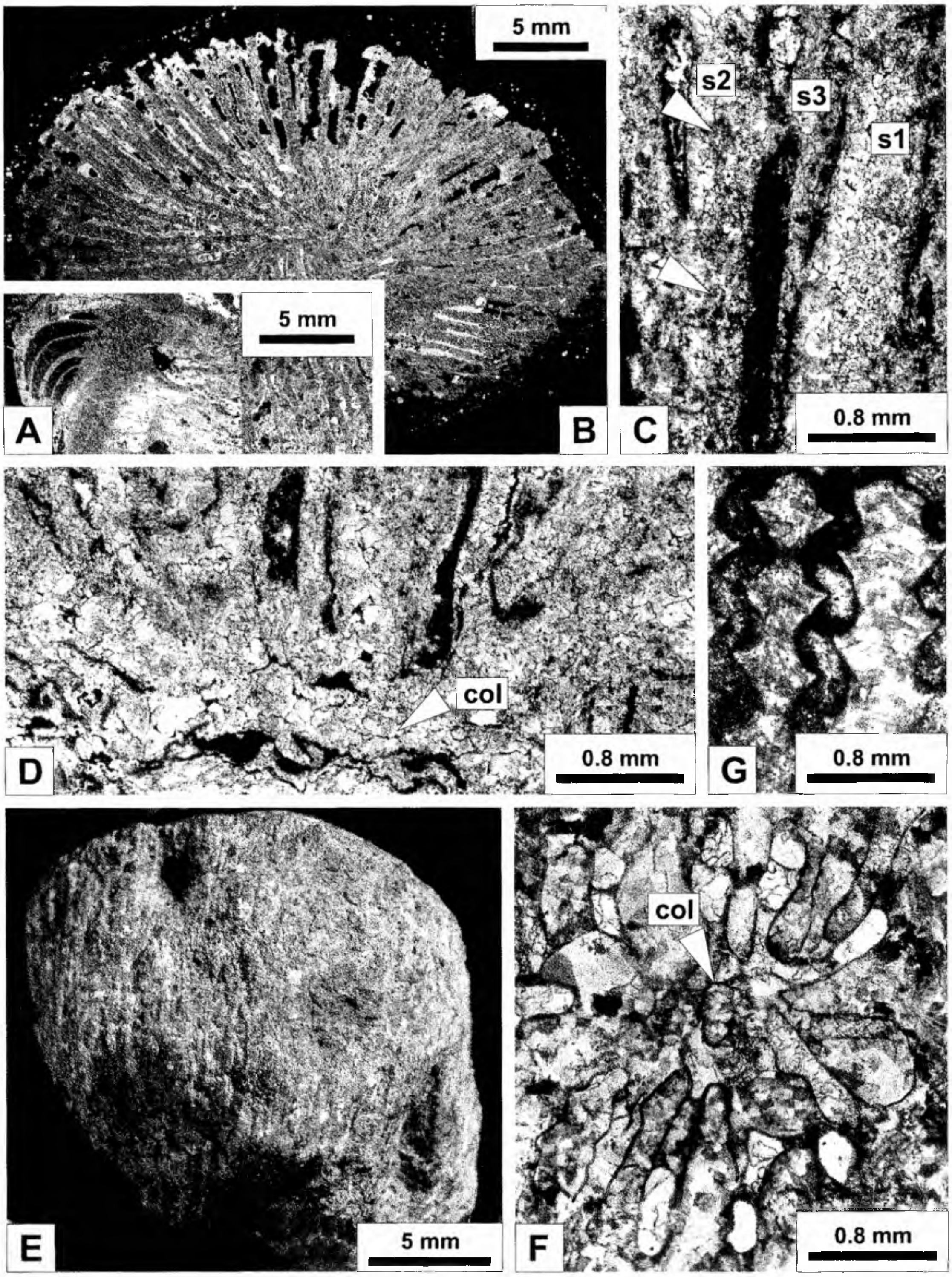

Fig. 29. **A–E.** *Peplosmilia fromenteli* Angelis d'Ossat: A – fragment of peripheral endothecal elements in longitudinal section (UJ 158P 54b); B – corallum in transverse section (UJ 158P 54a); C – enlarged portion of B showing S1 and S2 septa subequal in thickeness and considerably thinner septa S3. Note, in very poorly preserved skeleton (replaced by sparite), faint traces, perhaps of calcification centres (arrows); D – magnified fragment of B, illustrating the axial part of corallite with lamellar columella (col) in continuation with two opposite septa S1; E – side view of corallum (UJ 158P 54); **F, G.** *Stylomaeandra* sp.; F – central part of corallite in thin section (UJ 158P 103a) showing styliform columella (col); G – longitudinal section across the pennulate septa (thin section UJ 158P 54b)

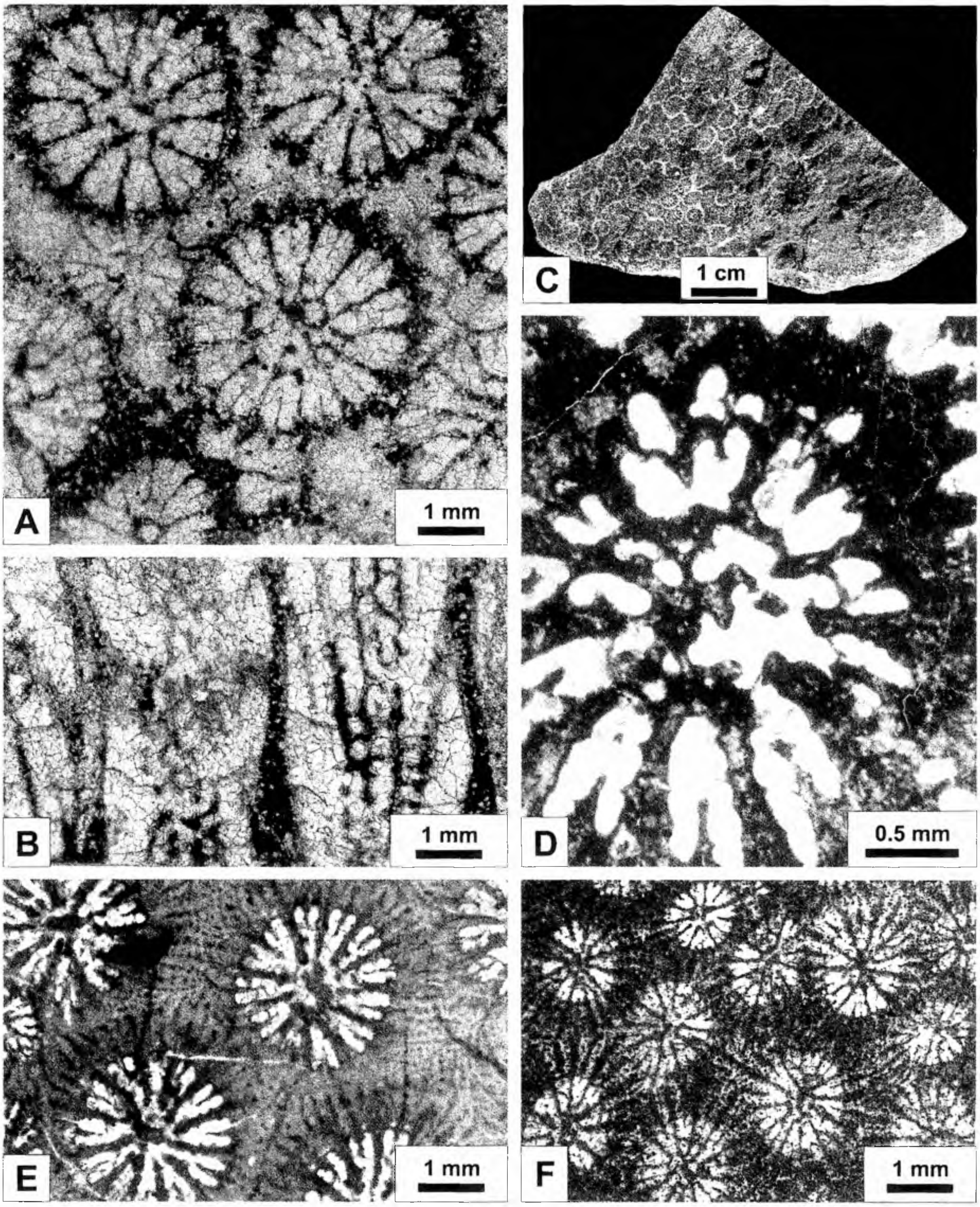

Fig. 30. **A–C.** *Neocoenia subpolygonalis* Hackemesser: A – transverse section of corallites (thin section UJ 158P 50a); B – longitudinal section showing thin, sparse endothecal tabuloid elements (UJ 158P 50b); C – fragment of calicular surface (UJ 158P 50); **D.** *Neocoenia subpolygonalis* Hackemesser (part of corallite from the specimen from Renz collection; Hackemesser, 1936, pl. 3, fig. 7, 8); **E.** *Columnocoenia ksiazkiewiczi* Morycowa; Transverse section of corallites (thin section UJ 158P 14a); **F.** *Columnocoenia bucovinensis* Morycowa; transverse section of corallites (thin section UJ 158P 47a)

(Fig. 29C) that may represent the traces of calcification centres, and in longitudinal section the traces of trabeculae disposed in one fan system can be observed.

Remarks: The specimen from Agrostylia differs from that described by Angelis d'Ossat (1905a) from Catalonia in less high corallum.

Distribution:
Barremian – Turkmenistan
Barremian–Early Aptian – East Serbia
Barremian–Aptian – Slovenia
Aptian – North Spain, Catalonia; Greece, Helicon Mts.(Boeotia: Livadia city)
Albian – Tibet, Xizang
early Coniacian – Austria, Kalkalpen: Brandenberger Gosau

Family ISASTREIDAE Alloiteau 1952

Genus *Tricassastraea* Alloiteau 1966
Type species: *Astrocoenia magnifica* de Fromentel 1857

Tricassastraea cf. *parnassensis* ALLOITEAU 1966
Fig. 28F

v1966. *Tricassastraea parnassensis* Alloiteau: Alloiteau & Dercourt; p. 321-322, pl. 1, fig. 4, 6.
1997. *Tricassastraea parnassensis* Alloiteau: Morycowa & Marcopoulou-Diacantoni, pl. 7, fig. 2 (not fig. 1).

Material: 1 fragment of colony: UJ 158P 17; 2 thin sections: UJ 158P 17a, b.

Dimensions (in mm):

d	3-4
S	24
den gr (transv. section of septa)	ca 6/1 mm

Description: Fragment of cerioid colony with, in cross section, polygonal corallites. Three cycles of septa arranged in two size orders. 12 septa (S1 size orders) reach near to the columella, 12 younger attain half of S1 length. In transverse section of septa regularly arranged pointed granulations (carenae?) are to be observed. Wall septothecal. Columella styliform. Endotheca subtabuloid.

Microstructure: Calcification centers of trabeculae are arranged in sets of 2 or 3 at regular intervals perpendicularly to the length of septa.

Remarks: The specimen of this genus has the skeleton morphology similar to *Actinastrea* but its microstructure is like that of *Isastrea*. It seems that the small fragment of colony coming from Agrostylia represents the species described by Alloiteau (in: Alloiteau & Dercourt, 1966). The septal ornamentation of this specimen is presented by Morycowa & Marcopoulou-Diacantoni (1997, pl. 7, fig. 2).

Distribution:
Cenomanian – Greece, Argolide Septentrionale (South of Corinth).

Family PLACOCOENIIDAE Alloiteau 1952

Genus *Columnocoenia* Alloiteau 1952
Type species: *Columnocoenia lamberti* Alloiteau 1957

Columnocoenia ksiazkiewiczi Morycowa 1964
Fig. 30E

1964. *Columnocoenia ksiazkiewiczi* Morycowa: p. 67-69, text-fig. 16, pl. 17, figs 1-4a-b; pl. 18, fig. 1a-c.
1968. *Columnocoenia ksiazkiewiczi* Morycowa: Kruglov & Kuzmicheva, p. 59.
1971. *Columnocoenia ksiazkiewiczi* Morycowa: Morycowa, p. 95, pl. 24, fig. 1, text-fig. 30A-B.
1977. *Columnocoenia ksiazkiewiczi* Morycowa: Khalilov *et al.*, p. 89, 90.
1980. *Columnocoenia ksiazkiewiczi* Morycowa: Kuzmicheva, p. 97, pl. 36, fig. 2.
1987. *Columnocoenia ksiazkiewiczi* Morycowa: Kuzmicheva, p. 236, pl. 3, fig. 2a-b.
1988. *Columnocoenia ksiazkiewiczi* Morycowa: Kuzmicheva, p. 162-163, pl. 3, fig. 4.
1989. *Columnocoenia ksiazkiewiczi* Morycowa: Morycowa, p. 64, pl. 20, figs 1, 2.
1989. *Columastraea striata* (Goldfuss): Löser, p.116, texte-fig. 22, pl. 25, fig. 1.
1991. *Columnocoenia ksiazkiewiczi* Morycowa: Prinz, p. 196, pl. 8, figs 7, 8.
1991. *Columnocoenia ksiazkiewiczi* Morycowa: Scott & Gonzalez-León, p. 62, fig. 6F.
1993. *Columnocoenia ksiazkiewiczi* Morycowa: Baron-Szabo, p. 158, pl. 3, fig. 1a-c.
?1993. *Columnocoenia* cf. *ksiazkiewiczi* Morycowa: Baron-Szabo, p. 158-159.
1994. *Columnocoenia* cf. *ksiazkiewiczi* Morycowa: Löser, p.19, pl. 5, figs 5, 6; pl. 10, figs 1-3; pl. 12, fig. 3, text-figs 10-11.
1995. *Columnocoenia* cf. *ksiazkiewiczi* Morycowa: Abdel-Gawad & Gameil, p.15, pl. 12, figs 11, 12.
?1995. *Columnocoenia* cf. *ksiazkiewiczi* subsp. Morycowa: Löser & Raeder, p. 47.
1996. *Columnocoenia ksiazkiewiczi* Morycowa: Császár & Turnšek, p. 430, fig. 7: 7.
1996. *Columnocoenia ksiazkiewiczi* Morycowa: Baron-Szabo & Steuber, p. 12, pl. 4. figs 5, 6.
1997. *Columnocoenia ksiazkiewiczi* Morycowa: Morycowa & Marcopoulou-Diacantoni, pl. 6, figs 5, 6.
?1997. *Columnocoenia ksiazkiewiczi* Morycowa: Baron-Szabo & Fernandez-Mendiola, p. 47, fig. 5C.
?1997. *Columnocoenia* cf. *ksiazkiewiczi* Morycowa: Baron-Szabo, p. 58, pl. 4, fig. 3.
1998. *Columnocoenia ksiazkiewiczi* Morycowa: Morycowa & Masse, p. 756, 758, Fig.12.9.
1998b. *Columnocoenia ksiazkiewiczi* Morycowa: Löser, p.176.
1998. *Columnocoenia ksiazkiewiczi* Morycowa: Schöllhorn, p. 88-89, text-fig. 40, pl. 20, figs 6, 7; pl. 27, fig. 5, pl. 29, fig. 3.
1999. *Columnocoenia ksiazkiewiczi* Morycowa: Baron-Szabo & Gonzalez León, p. 473, 475, fig. 3a.

Material: 6 specimens: UJ 158P: 13, 14, 43, 44, 45, 46; 14 thin sections: UJ 158P:13a-c, 14a, 43a, b, 44a, 45a-g.

Dimensions (in mm):

Nos	d	c-c	S	D	H
No. 13	2.5-3.5	3.5-4.5	24		
No. 14	2.5-3	2.5-3 (3.5-4)	24	55×70	ca 40
No. 43	2.5-3.5	3.5-4.5 (5)	24	40×106	ca 50
No. 44	2.0-3.0	3.0-4 (4.5)	24	80×104	ca 65
No. 45	2.5-3.0 (4)	3.0-4.5 (5)	24		

Remarks: Massive, plocoid colonies.The morphology and skeleton microstructure of *Columnocoenia ksiazkiewiczi* is well known. This species has large distribution in Lower Cretaceous.

Some authors identify as *C. ksiazkiewiczi* the specimens having larger calicular diameters and more numerous radial elements than those in the holotype (Morycowa, 1964). For example: the Aptian *C. ksiazkiewiczi* from East Alps (Allgäu Schrattenkalk; Baron-Szabo, 1997) has calicular diameter of adult forms: 3–4.5 mm and up to 26 septa, *C. ksiazkiewiczi* from the Aptian of Delfi-

Arachova region in Greece (Baron-Szabo & Steuber,1996) has calice diameters of 2.5–4 mm, and up to 30 septa and "*C.* cf. *ksiazkiewiczi* subsp." from Helicon Mountains (Boeotia, Greece; Löser & Raeder, 1995) has 24–32 radial elements. Some of the parameters mentioned above seem to be well within the intraspecific variability of the species *C. ksiazkiewiczi*. If it is accepted that *C. ksiazkiewiczi* have calicular diameters from about 2 to 4 mm (calice diameters in holotype 2 to 3.0 (3.5) mm; 24 costosepta), the specimens having calicular diameters larger than 4 mm could be described as *C.* aff. *ksiazkiewiczi*.

According to Löser (1998b), the specimen identified by him in 1989 as *Columastraea striata* (Goldfuss) from the Cenomanian of Saxony could be placed in the synonymy of *Columnocoenia ksiazkiewiczi*.

Columnocoenia is related to *Neocoenia* described by Hackemesser (1936) from the Cenomanian of Greece (*Neocoenia renzi* and *N. subpolygonalis*; C. Renz collection, Museum of Natural History, Basel). The genus *Neocoenia* has not yet been studied in detail. The difference between *Columnocoenia* and *Neocoenia* is due to more rounded pali or septal paliform lobes of the latter. These paliform structures together with the small styliform columella look like papillar columella. The skeleton of the type species of *Neocoenia* (*Neocoenia renzi* Hackemesser; Hackemesser, 1936, pl.3, figs 4, 5; C. Renz coll., 6127) is poorly preserved, but *N. subpolygonalis* (C. Renz coll., 6128) shows traces of the original microstructure, which is similar to that of *Columnocoenia* (see Fig. 30D).

Microstructure: In transverse section of radial elements of specimen No. 13, the distance between trabecular centres is about 100–150 μm.

Distribution:

Hauterivian – Hungary, the Mecsek Mountains

Early Barremian – Turkmenistan, Small Balkhan

Barremian – Azerbaijan and Georgia;

Barremian–Early Aptian – Poland, Outer Carpathians

Barremian–Aptian – Ukraine, Zone Marmarosch; Kruglov & Kuzmicheva, 1968

Late Barremian–Middle Albian – Mexico, Sonora (Cerro de Oro and Lampazos)

Early Aptian – Rumania, Eastern Carpathians; France: Provence (Monts de Vaucluse; Greece: Parnassos near Delfi-Arachova; ?Austria/Germany: Eastern Alps: Helvetic Zone (Allgäu Schrattenkalk)

Late Aptian – North Spain, Cantabria (South Pyrenees)

Aptian–Albian – Greece, Helicon Mountains (Boeotia)

Albian – North Spain, Cantabria (Cabo de Ajo)

early Cenomanian – Germany, Saxony and Westphalia

Columnocoenia bucovinensis Morycowa, 1971
Fig. 30F

1971. *Columnocoenia ksiazkiewiczi bucovinensis* Morycowa: p. 96-98, Text-figs 30 C, D, pl. 24, fig. 1.

1981. *Columnocoenia ksiazkiewiczi bucovinensis* Morycowa: Turnšek & Mihajlović, p. 20, pl. 16, figs 1-2.

1994. *Columnocoenia ksiazkiewiczi bucovinensis* Morycowa: Löser , p. 20-21, pl. 10, figs 2, 3.

?1996. *Columnocoenia ksiazkiewiczi bucovinensis* Morycowa: Baron-Szabo & Steuber, p. 12-13, pl. 5, figs 1, 5.

1999. *Columnocoenia bucovinensis* Morycowa: Baron-Szabo & Gonzáles-León, p. 473, fig. 2j.

Material: 1 fragment of colony: UJ 158P 47, 2 thin sections: UJ 158P 47a, b.

Dimensions (in mm):

d	1.5-2.0 (2.3)
c-c	1.5-2.5
S	24

Remarks: This specimen does not differ from those described in Morycowa (1971) from the Aptian of the Romanian Carpathians.

The Aptian specimen from Greece presented by Baron-Szabo (in Baron-Szabo & Steuber, 1996) differs from the holotype in more numerous radial elements (24–30). The specimens from Mexico studied by Baron-Szabo (Baron-Szabo & Gonzalez León, 1999) have also more radial elements (S: 24 + n S4).

Distribution:

Barremian–Early Aptian – Eastern Serbia, Planinica

Late Barremian–Early Aptian – Mexico, Sonora (Cerro de Oro)

Early Aptian – Romanian Carpathians, Rarau

Aptian – ?Greece, Parnassos, near Delfi-Arachova

early Cenomanian – NW Germany, Westphalia

Columnocoenia sp.

Material: Large colony: UJ 158P 49; 1 thin section: UJ 158P 49a.

Dimensions (in mm):

d	3-4.5
c-c	3.5-5.5
S	24

Remarks: Fragment of large massive colony (D: 5×10 cm, H ca 10 cm).

Columnocoenia sp. differs from *C. ksiazkiewiczi* in larger diameter of corallites. The diameters of corallites *C. ksiazkiewiczi* described by Baron-Szabo from the Aptian of Greece (Baron-Szabo & Steuber,1996) and from the East Alps (Baron-Szabo, 1997) correspond rather to these presented here as *Columnocoenia* sp.

Genus *Neocoenia* Hackemesser 1936
Type species: *Neocoenia renzi* Hackemesser 1936

Neocoenia subpolygonalis Hackemesser 1936
Figs 30 (A–C)

v1936. *Neocoenia subpolygonalis* Hackemesser: p. 25-26, pl. 3, figs 7, 8.

1997. *Neocoenia subpolygonalis* Hackemesser: Baron-Szabo, p. 64, 66, pl. 5, fig. 2; pl. 6, fig. 2.

Material: 1 specimens: UJ 158P 50, 4 thin sections: UJ 158P 50a-d.

Dimensions (in mm):

D	60×90
H	ca 70
d	2.8-3.5 (4-4.5)
c-c	3.0-4.5 ((7))
S	24

Description: Colony massive, plocoid. Calices rather deep, subcircular. Budding intercalicinal. Costosepta compact, differentiated into 2 size orders. Septa S1 and S2 are equal or subequal in thickness and length, septa S3 are considerably thinner than S1 and they attain about half of the length of S1. Small rounded or slightly elongated paliform lobes before the septa of first size orders. Costae nonconfluent, mainly very short. Septal faces of costosepta covered with rare sharp granulations. Columella papillar-like, formed by small, styliform columella, subcircular in transverse section, and by trabecular projections of internal septal edges of the long septa. Wall mainly thin septothecal – parathecal. Endotheca formed of thin tabuloid elements.

Remarks: The specimen differs from *C. renzi* Hackemesser (1936, pl. 3, figs 4, 5) mainly in slightly larger diameter of corallites and often in shorter costae (d in *C. renzi* = 1.5–2.3 mm). With regard to *Neocoenia* see remarks concerning *Columnocoenia ksiazkiewiczi* and Fig. 30D.

Microstructure: *N. subpolygonalis* shows traces of the original microstructure, which is similar to that of *Columnocoenia* Alloiteau.

Distribution:

Cenomanian – Central Greece, Panourgias (= Dremisa) in Giona Massif

early Coniacian – Austria/Germany, Northern Alps (Brandenberg Gosau)

Family DERMOSMILIIDAE Koby 1889

Genus *Calamophylliopsis* Alloiteau 1952
Type species: *Calamophyllia flabellata* de Fromentel 1861

Calamophylliopsis fotisaltensis (Bendukidze, 1961)
Fig. 31 (A–D)

1961. *Procladocora fotisalensis* Bendukidze: p. 19-20, pl. 2, figs 5a-b.
1966. *Calamophylliopsis fotisalensis* (Bendukidze): Morycowa & Lefeld, p. 537-538, pl. 34, fig. 2a-e; text-fig. 5.
1976. *Calamophylliopsis fotisalensis* (Bendukidze): Turnšek & Buser, p. 27, 47, pl. 20, figs 1-4.
1992. *Calamophylliopsis fotisalensis* (Bendukidze): Turnšek *et al.*, p. 219, pl. 5, figs 3-6.
1989. *Calamophylliopsis fotisalensis* (Bendukidze): Morycowa, p. 66, pl. 30, figs 1, 2.
1993. *Calamophylliopsis fotisalensis* (Bendukidze): Baron-Szabo, p.163, pl. 6, fig. 3.
1997. *Calamophylliopsis fotisalensis* (Bendukidze): Baron-Szabo & Fernandez-Mendiola, p.47, fig. 6D, F.
1997. *Calamophylliopsis fotisalensis* (Bendukidze): Morycowa & Marcopoulou-Diacantoni, p. 252, pl. 7, fig. 3.
1998. *Calamophylliopsis fotisalensis* (Bendukidze): Schöllhorn, p. 91, pl. 20, fig. 8.
1998. *Calamophylliopsis fotisalensis* (Bendukidze): Morycowa & Masse, p. 758, fig. 19.3.

Material: 3 incomplete colony: UJ 158P: 29; 34. 35; 7 thin sections: UJ 158P: 29a-c, 34a-d.

Dimensions (in mm):

	No. 29	No. 34	After Bendukidze, 1961
D	ca 50×55	35×55	
H	ca 40	ca 50	
d cor	3.5-5.0 (5.5)	(3.5) 4-5.5 (6)	4-6
c-c		4.5-8	
d l	3-4.5		
S	24 + nS4	32-34	30-38
den c	4-6/2	5-6/2	7/2
th w + costae		0.5-0.8	
distance between epithecal rings		ca 4	
d tr		ca 50-100 μm	

Description: Phaceloid colony. Lateral surface of corallites with sparse epithecal rings. Calices circular or subelliptic. Costosepta thin, compact, except for the internal edges, differentiated in three size orders. Parietal columella. Subtabuloid endotheca.

Remarks: This species is well known and abundant in the Lower Cretaceous rocks of Europe.

C. fotisalensis resembles Jurassic corals, *Calamophylliopsis moreauana* (Mich.) in corallite diameters (d: 2.9–5(6.5)), but differs from it in less numerous septa (costosepta in C. *moreauana*: 32–50 (60); e.g., Roniewicz, 1966; Turnšek, 1997; Errenst, 1990).

Remarks: Eliášová (1997a) described *Calamophylliopsis* sp. from upper Cenomanian of Bohemia which is similar in corallite diameters and the number of radial elements to the Greek specimen.

Distribution:

Early Hauterivian – Ukraine, Crimea (Fotisala)

Barremian–Aptian – Slovenia

Early Aptian – France, Monts de Vaucluse: Rustrel

Late Aptian (age after Masse & Uchman 1997) – Poland, Carpathians (Tatra Mts, Wysoka Turnia);

Late Aptian–Early Albian – North Spain, Prov. Guernica (Playa de Laga)

Late Aptian–Middle Albian – Slovenia, Kocevje Region, Slovenski vrh

Late Aptian – North Spain, Central Catalonian Pyrenees

Albian – N-Spain, Prov. Cantabria (Capo de Ajo)

Calamophylliopsis sp.
Fig. 28E

Material: 5 specimens: UJ 158P: 63, 64, 65, 66, 67; 7 thin sections: UJ 158P: 63a-e, 66a, b.

Dimensions (in mm):

	No. 66	Nos 63, 67
d cor monocentric	2.5-3.5 (4)	2-3
d cor dicentric	4.5-7	
c-c	3.5-6.5 (8)	3-5
S	24-32	24-32
C	24-32 (36)	24-32 (34)
den c	6-7/2	
th w	ca 0.4	ca 0.1-0.2

Description: Fragments of phaceloid colonies. Corallites subcircular, not closely spaced. Costosepta subcompact, differentiated into 2 or 3 size orders. About 12 of them (first size order) reach the center and form small, parietal columella. Septo-parathecal wall. Endotheca composed of subtabuloid elements.

Remarks: The species differs from *Calamophylliopsis fotisalensis* (Bendukidze) only in smaller corallite diameters. The specimen No. 66 differs from these described as No. 63 and 67 in slightly thicker wall.

Genus *Pleurocora* Milne Edwards et Haime1848
Type species: *Lithodendron gemmans* Michelin 1846

Pleurocora aff. *alternans* Milne Edwards et Haime 1848
Fig. 32 (A–F)

1848. *Pleurocora alternans* Milne Edwards & Haime: vol. 10, p. 312.
1850. *Pleurocora alternans* Milne Edwards & Haime: Orbigny (de), p. 183.
1857. *Pleurocora alternans* Milne Edwards & Haime: Milne-Edwards & Haime, 1857-1860: p. 603.
1930. *Pleurocora alternans* Milne Edwards & Haime: Kühn & Andrusov, p. 5-6.
1997. *Pleurocora* cf. *alternans* Milne Edwards & Haime: Baron-Szabo, p. 77, pl. 10, figs 4, 6.
1997. *Pleurocora* cf. *alternans* Milne Edwards & Haime: Sanders & Baron-Szabo, pl. 21, fig. 4.

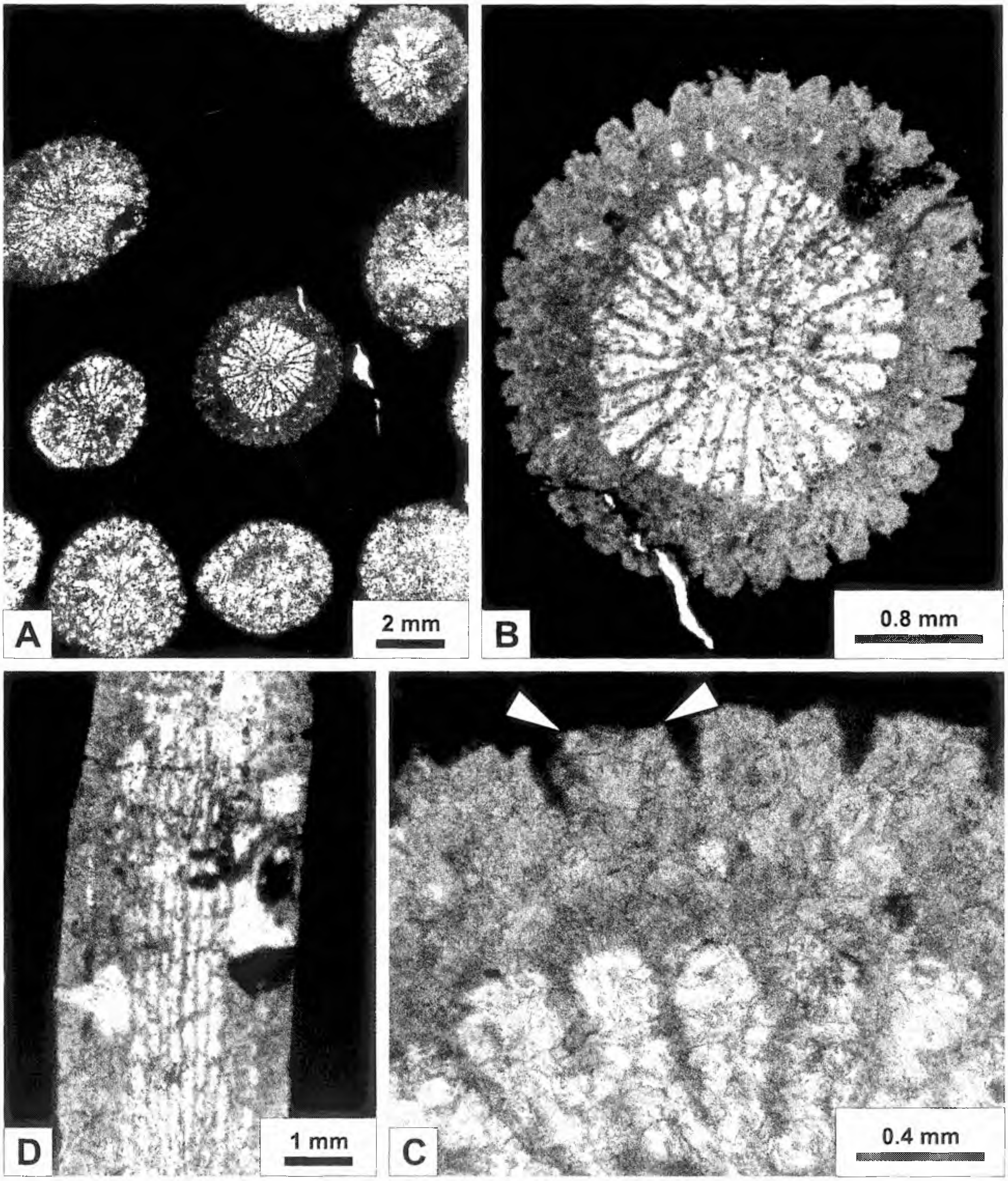

Fig. 31. A–D. *Calamophylliopsis fotisaltensis* (Sikharulidze): A – transverse section across fragment of phaceloid colony (UJ 158P 34a); B, C – enlarged details of A. Note subequal, thick, double costae, each composed of one well developed and one rudimentary (arrows); D – corallite in longitudinal section (UJ 158P 34b)

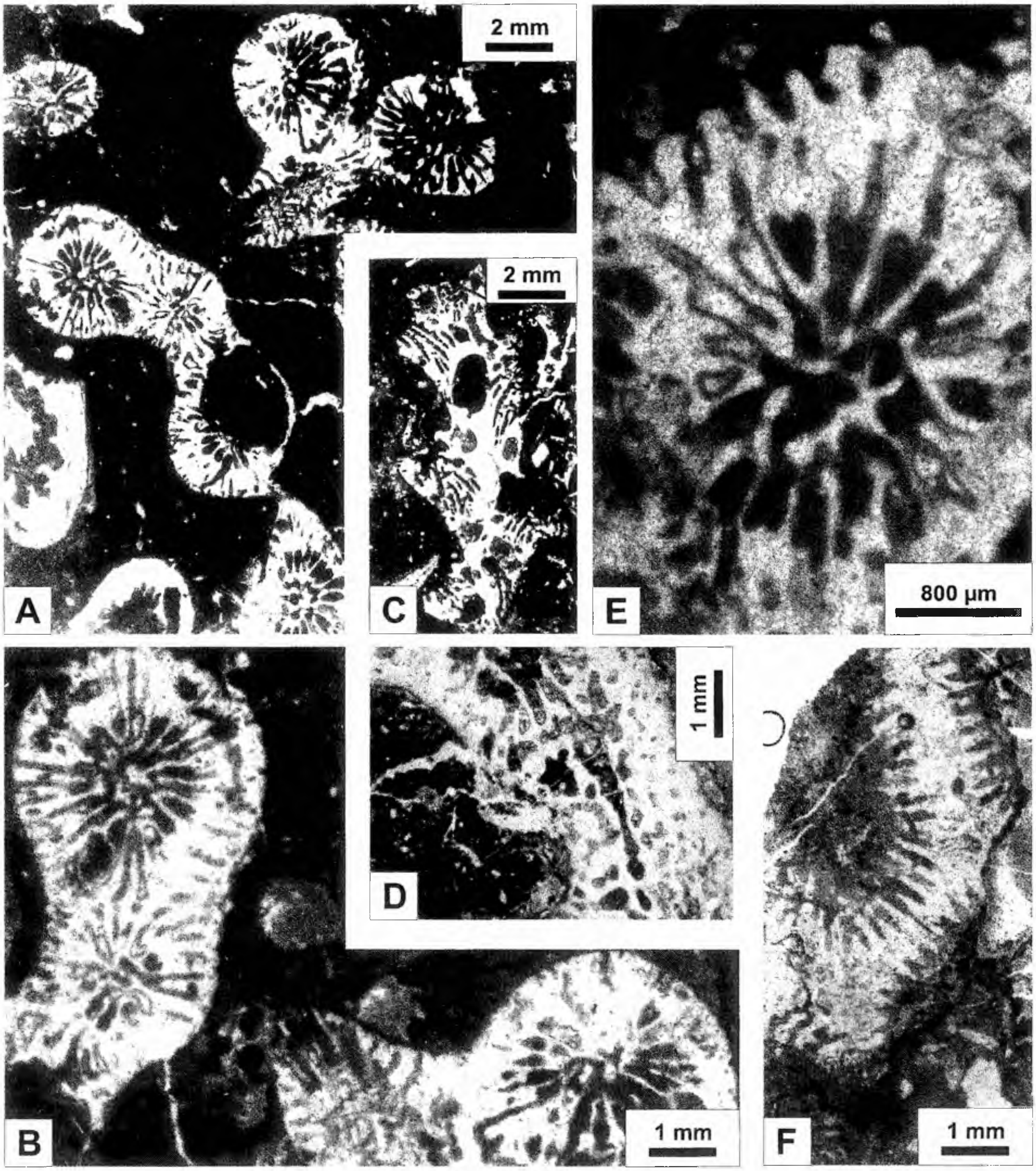

Fig. 32. A–E. *Pleurocora* aff. *alternans* Milne Edwards & Haime: A – transverse thin section (UJ 158P 90a) of phaceloid colony; B – enlarged fragment of A, showing thick corallite walls and paliform lobes of septa; C – longitudinal thin section (UJ 158 90b) across one branch of colony showing alternating disposition of particular corallites; D – porous wall of corallites (?synapticulotheca); E – enlarged detail of A; F – *Meandroria* sp. – transverse thin section (UJ 158P 39a) of fragment of meandroid colony

?1999. *Pleurocora* cf. *alternans* Milne Edwards & Haime: Baron-Szabo, p. 455, pl. 3, fig. 2.

Material: 1 colony: UJ 158P 90; 3 thin sections: UJ 158P 90a-c.
Dimensions (in mm):

	No. 96	M.-Edw. & H., 1848	Baron-Szabo, 1997
D	30×40		
H	ca 20		
d cor	(2) 3-4.2 (5)	d cal 3	
d l	2-3		2-4
c-c	(3) 4.5-7.5		
c-c (in joined corallites)	3-4.5		
th w	0.5-0.8		
S	ca 32-42	36	24-40 (44)

Description: Fragments of subdendroid colony. Lateral surface of branches with thin subequal costae. Lateral budding. Short young corallites occurring alternately on lateral sides of branches. From 2 to 4 corallites, older and younger, often joined laterally. Corallites subcircular in transverse section. Thick wall, probably synapticulothecal or septothecal-synapticulothecal type. Septa thin, subequal in thickness, enlarged only in the wall zone. About 16 to 18 first-size order septa have paliform lobes. Shorter septa occur irregularly between them. Costae subequal. Small oval or thin-lamellar columella. Tabuloid endothecal dissepiments sparse.
Remarks: The diagnosis of the genus *Pleurocora* is imprecise (see Alloiteau, 1957, p. 186). Milne Edwards (1848) placed this genus near *Cladocora* in the family "Cladocoriens". Alloiteau (1952) and Wells (1956) included it in the family Heliastraeidae. Turnšek (in Turnšek & Polšak, 1978) shifted this genus from the family Heliastraeidae to Haplaraeidae. Taking into account the morphological features of the specimens here described as *Pleurocora* it seems to be more appropriate to place it in the family Dermosmiliidae Koby. Unfortunately, the microstructure of the type specimens is not known. For example, one of the generic features of this genus is thick corallite wall, but we do not known what type it is. It seems that in our specimen it could be septotheca-?synapticulotheca, but without the microstructure this is only a supposition based on wall skeleton morphology. It is also not clear whether the specimens of this taxon have pali or only paliform lobes.

Pleurocora is known in Upper Cretaceous rocks mainly from Alps (Turonian–Senonian; e.g., Oppenheim, 1930; Turnšek & Polšak, 1978; Baron-Szabo, 1997; Sanders & Baron-Szabo, 1997; Kühn & Andrusov, 1930).

The specimen from Agrostylia is very close to *Pleurocora* cf. *alternans* M. Edw. & H. presented by Baron-Szabo from Lower Coniacian of the Eastern Alps (Brandenberger Gosau; Baron Szabo, 1997) and from the Turonian–Campanian in the Northern Calcareous Alps (Austria; in Sanders & Baron-Szabo, 1997).
Distribution:
Late Santonian–Early Campanian – Slovakia
Campanian – Belgium
early Coniacian – Austria, Northern Calcarous Alps (Brandenberg Gosau)
Turonian–Campanian – Austria, Northern Calcarous Alps (Haidach area)
Late Santonian–Campanian – Austria, Weissenbachalm region

Suborder MICROSOLENINA
Morycowa et Roniewicz 1995

Family LATOMEANDRIDAE de Fromentel 1861

Genus *Latomeandra* Milne Edwards et Haime 1848
Type species: *Lithodendron plicatum* Goldfuss 1826

Latomeandra minor Reig Oriol, 1975
Fig. 28C, D

1995. *Latomeandra minor* Reig Oriol, p. 38-39, pl. 6, figs 8, 9.

Material: 1 fragment of colony: UJ 158P 91, 1 thin section: UJ 158P 91a.
Dimensions (in mm):

d cor	8-11×12-14 (10×13, 8×12, 9×14, 11×12)
S	ca 80 (S1-S4)
th S1	ca 0.2-0.25
th S3	ca 0.5-0.1
den s	5-7/2
c-c	14-16

Description: Fragment of phaceloid-dendroid colony. Calices suboval. Costosepta thin, irregularly perforated, differentiated into three, rarely four, size orders. In the outer zone of corallites (wall zone), the septa are subequal or alternate in thickness. Septal faces with pennulae and menianae. Columella parietal. Wall parathecal-synapticulothecal. Endotheca vesicular.
Remarks: The specimen from Agrostylia differs from the specimen from Spain (Reig Oriol, 1975) in slightly larger corallite diameters (Spanish specimen: d: 5–10 mm, S: 75 in the corallites having 8 mm in diameter).

Latomeandra minor from the Agrostylia differs from *Latomeandra* sp. described by Eliášová (1997a) from the upper Cenomanian rocks of Bohemia in larger corallite diameters and more numerous radial elements.
Distribution:
Albian – Spain, Catalonia (Marmella: Tarragona)

Genus *Ovalastrea* d'Orbigny, 1949
Type species: *Astrea caryophylloides* Goldfuss, 1826

Ovalastrea baumbergeri (Koby, 1897)
Fig. 12 (A–C)

v1896-1898. *Favia Baumbergeri* Koby: p. 52, pl. 10, fig. 5, 5a.
1909. *Favia baumbergeri* (Koby): Prever, p. 84, pl. 4, fig. 3, 3a.
1979a. *Ellipsocoenia baumbergeri* (Koby): Sikharulidze, p. 38, text-fig. 21; pl. 25, fig. 1a, b.

Material: 3 fragments of colony: UJ 158P: 92, 93, 94; 4 thin sections: UJ 158P: 92a-d.
Dimensions (in mm):

	No. 92 (largest specimen)
D	45×20
H	35
d circular	ca (3) 3.5-5
d elongate	to 6.5 (-9)
c-c	(3.5) 4.5-5.5 (7.5)
S	32-42 (to 62 during the budding)
den s (wall reg.)	5-7/2
th S1 (wall reg.)	ca 0.2-0.3
den pen (long. section)	5-6/2
den cc (septa)	7-10/1

Description: Three fragments of massive, subplocoid-subcerioid colony. Calices circular, oval and elongated, due to intercalicinal, marginal budding. Intercalicinal space very narrow, frequently with ambulacrum. Radial elements subcompact, differentiated into three or four (incomplete) size orders. Septa S1 (about 12 to 16) reach the columella. Generally two first size orders are subequal and younger septa are gradually shorter and thinner. Anastomosis between septa takes place frequently by joining the internal edges of shorter septa with the lateral faces of neighbouring, larger ones. Pennulae and menianae subhorizontal, smooth-edged. Columella papillar, loose, composed of trabecular projections of the edges of S1 septa. Costae very short, nonconfluent, in places subconfluent. Wall parathecal, sporadically septothecal. Synapticulae occur in the wall zone. Endotheca composed of thin-walled vesicular or subtabuloid dissepiments, oblique in the outer zone of corallites. Exotheca very narrow, vesicular. Microstructure of skeleton poorly preserved.

Remarks: According to Koby, the specimen *O. baumbergeri* (Koby, 1897) has density of septa 16 per 3 mm and confluent costae. My observations of the specimen presented by Koby (1897, in 1896-98, pl. 10, fig. 5, 5a, Koby's coll., No. 2555, Museum in Basel) indicate that density of septa is in places from 9 to 12 per 3 mm, and costae are mainly confluent but also subconfluent.

O. baumbergeri from the Albian of Georgia (Sikharulidze, 1979a) shows differences in the development of costae, which are all nonconfluent and alternating in length.

Distribution:
Valanginian – Switzerland, near Twann
Albian – Italy, Abruzzi (Monte d'Ocre); ?Georgia

Genus *Latohelia* Löser 1987
Type specires: *Synhelia reptans* Počta 1897

Latohelia reptans (Počta 1887)
Fig. 33 (A–C)

1887. *Synhelia reptans*: Počta, p. 50, pl. 2, fig. 8, text-fig. 28.
1987. *Latohelia reptans* (Počta): Löser, p. 235, pl. 2, figs 1-3.
1989. *Latohelia reptans* (Počta): Löser, p. 141-143, text-figs 42-44, pl. 27, figs 3, 4.
1994. *Latohelia reptans* (Počta): Eliášová, p. 6-7, pl. 3, figs 3a, b, 4; pl. 6, fig. 3.
1997b. *Latohelia reptans* (Počta): Eliášová, p. 258.
1998b. *Latohelia reptans* (Počta): Löser, p. 180.

Material: 1 specimen (2 branches of colony): UJ 158P 104, 2 thin sections: UJ 158P 104a, b.
Dimensions (in mm):

D branches	8×10; 16×16
H branches	ca 40
d corallites	2.5-4.5
c-c	4-6.5
S	(24)30-38
den s (wall reg.)	3-4/1
hight of calice wall	2-4

Description: Fragments of branching, plocoid colonies with slightly excert corallites. Calices subcircular and suboval. Costosepta subcompact, nonconfluent or rarely confluent, 24 to ca 38 in number. They are arranged in two or three orders, in some adult corallites in four orders. About 12–16 long septa reach the centre of corallites. Their axial ends have paliform lobes. Pennulae can be seen in the longitudinal section of septa. Wall septothecal with not numerous synapticulae. Columella weak, papillar, composed of central trabecula and paliform lobes of S1 septa. Endotheca and exotheca vesicular. Budding intracalicinal. Skeleton microstructure not well preserved.

Remarks: The specimen from Agrostylia identified as *L. reptans* differs from the lectotype of this species redescribed by Löser (1987) only in less numerous radial elements and in the fourth cycle of septa less strongly developed.

L. reptans differs from *L. circularis* described by Baron-Szabo (1998) from the Campanian of North Spain mainly in the larger diameters of the corallites (in *L. circularis* d=1.5–2.5 mm).

Distribution:
late Cenomanian – Germany, Saxony; Czech Republic, Bohemia (Korycany, Netřeba)

Genus *Latiastrea* Beauvais, 1964
Type species: *Latiastrea foulassensis* Beauvais, 1964

Latiastrea paronai (Prever, 1909)
Figs 34 (A–E), 35A

1909. *Latimaeandraraea Paronai* Prever: p. 98-99, pl. 8, figs 6, 7, 7a.
1936. *Latimaeandraraea paronai* Prever: Hackemesser, p. 58.
1995. *Latiastraea paronai* (Prever): Löser & Raeder, p. 50.

Material: 1 colony: UJ 158P 98; 4 thin sections: UJ 158P 98a-d.
Dimensions (in mm):

D	35×40
H	ca 40
d	(3.5) 4-6 (7)
c-c	3-5 (5.5-6)
width of corallite series	3.5-5
length of corallite series	to 10 mm
S	(20) 32-64
den s	6-7 (8)/2

Description: Massive, cerioid colony. Calices subpolygonal, monocentric, in places short series composed of two or three individuals. Wall synapticulothecal-septothecal. Septa thick, irregularly perforated, differentiated into three or four size orders. In the outer zone of corallites (wall zone), the septa are subequal in thickness. Septal faces with pennulae and manianae. Parietal columella. Endotheca consists of vesicular dissepiments. Budding intracalicinal without septal connections.

Microstructure: Transverse section of the septa shows traces of irregularly branching, thick trabeculae. The diameters of the main trabeculae are about 150–200 µm.

Remarks: The species from Agrostylia resembles *Latimeandra Kaufmanni* Koby; 1897, p. 45-46, pl. 11, figs 1-2) described in many publications as. *Latiastrea kaufmanni* (Koby). However, I have doubts concerning the generic designation of this species. A redescription of Koby's specimens would be helpful.

Distribution:
Albian – Italy, Abruzzes (Monti d'Ocre)
Early Cenomanian – ?Greece, Giona massif (Panourgias)

Latiastrea mucronata Sikharulidze 1979
Fig. 34 (F, G)

1979a. *Latiastraea mucronata* Sikharulidze; p. 37, pl. 3, figs 4; pl. 23; pl. 24, fig. 1a,b.
1996. *Latiastraea mucronata* Sikharulidze; Császár & Turnšek, p. 433, fig. 10: 26.
1999. *Latiastraea mucronata* Sikharulidze; Baron-Szabo & Gonzáles-León, p. 490, fig. 6e.

Material: 1 fragment of colony: UJ 158P 99, 2 thin sections: UJ 158P 99a, b.

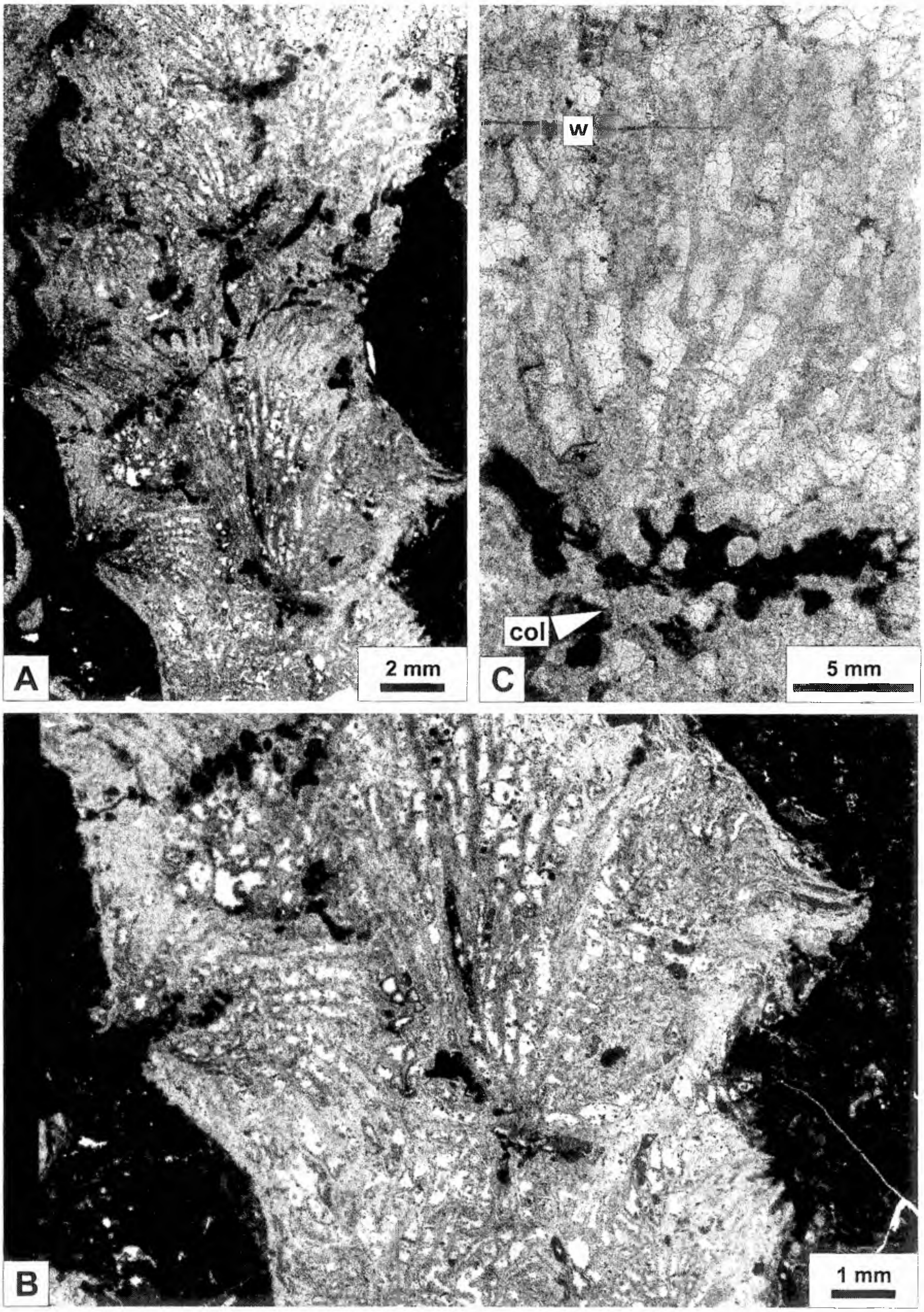

Fig. 33. A–C. *Latohelia reptans* (Počta): A – section of branching colony fragment with slightly excert corallites (thin section: UJ 158P 104a); B – enlarged fragment of A showing transverse and oblique sections of corallites; C – a detail of A, illustrating development of radial elements, septothecal wall (w) and weak papillar columella composed of central trabeculae (col) and paliform lobes of S1 septa

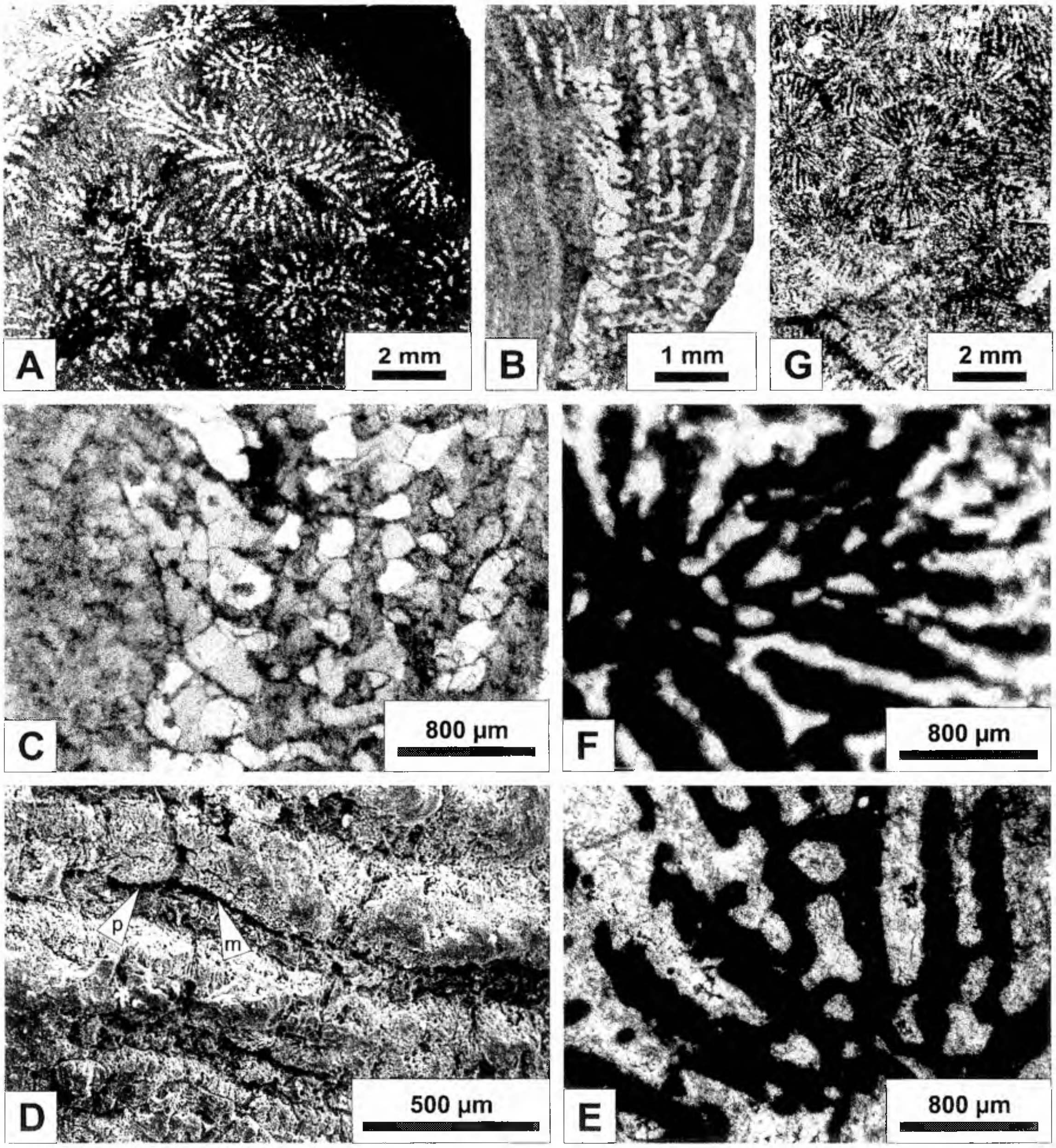

Fig. 34. **A–E.** *Latiastrea paronai* (Prever): A – transverse thin section (UJ 158P 98a), individual corallites and short series are visible; B, C – longitudinal sections (thin section UJ 158P 98b) of corallite. Note traces of septal pennules and thin tabuloid endotheca; D – radial elements in upper view (SEM). Note traces of pennules (arrow, p) and menianes (arrow, m) (UJ 158P 98); E – enlarged detail of A, showing central part of corallite; **F, G.** *Latiastrea mucronata* Sikharulidze: F – fragment of corallite presented in G – showing thin radial elements and weakly developed columella; G – transverse thin section (UJ 158P 99a)

Dimensions (in mm):

D	20×50
H	ca 30
d (subpolygonal)	2.5-3.5×3.5-4.5
d (elongated)	to 7
c-c	(2) 2.5-4.5
S	52-68
th S1 (wall reg.)	ca 0.1
den s (wall reg.)	7-10 (11)/2
den cc (septa)	ca 5-7/1

Description: Fragment of massive, cerioid colony. Calices subpolygonal, subcircular, rarely elongated, or in short, bicentric state. Septa very thin, irregularly perforated, differentiated into four or five size orders. In the outer zone of corallites (wall zone), the septa vary slightly in thickness. Septal faces with pennules and manianes. Parietal columella. Wall synapticulothecal – septothecal. Endotheca vesicular, in places subtabuloid. Intracalicinal budding without septal connections.

Microstructure: Transverse section of the septa shows traces of mainly branching trabeculae.

Remarks: The specimen differs from *Latiastraea mucronata* described by Sikharulidze (1979a) only in a slight variability of the density of septa.

Distribution:

Hauterivian – Hungary, Mecsek Mountains
Late Aptian–Middle Albian – Mexico, Sonora
Albian – Georgia (Caucassus)

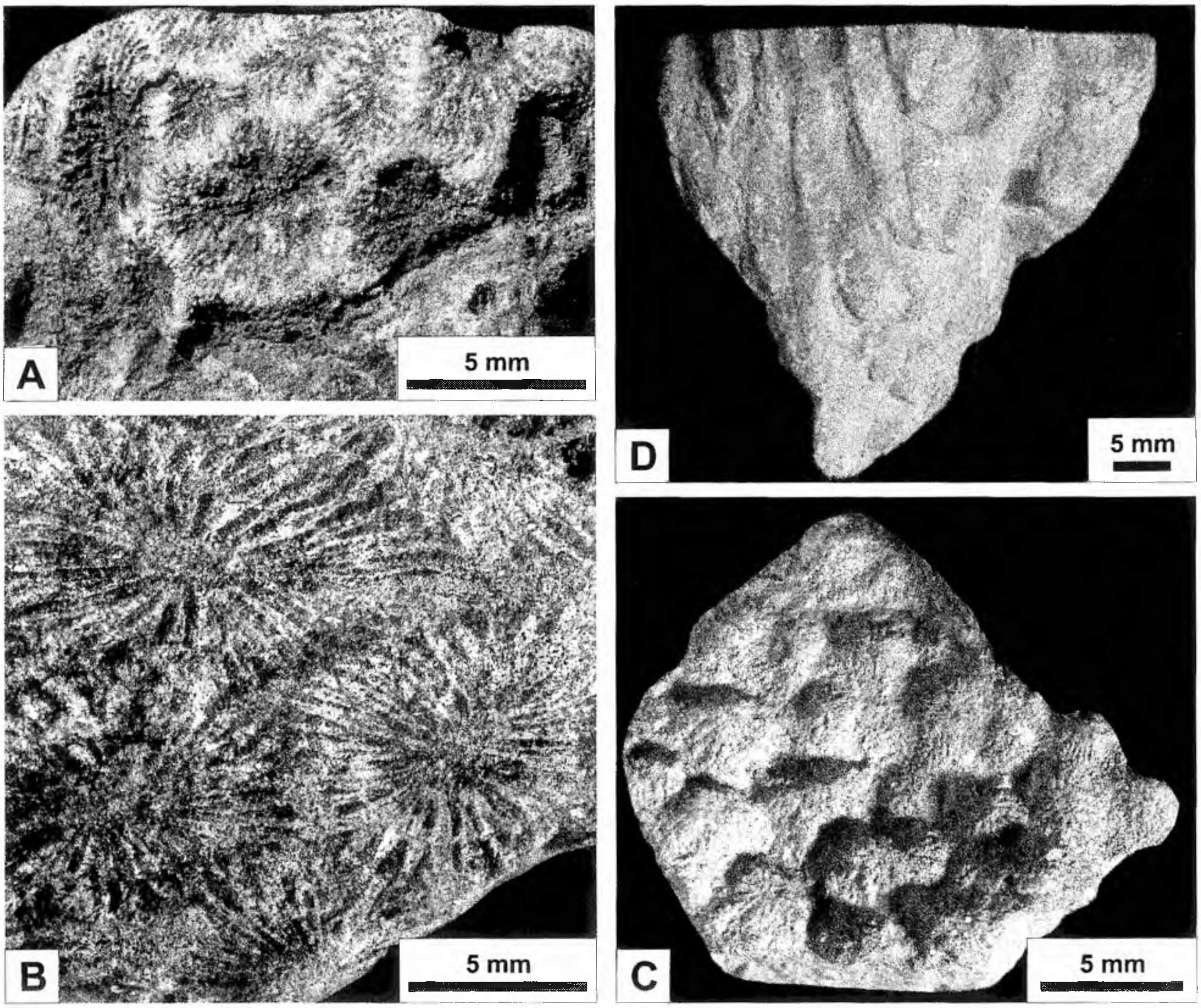

Fig. 35. *Latiastrea paronai* (Prever): **A.** Upper view of colony (UJ 158P 98); **B.** *Plesiofavia dubia* (de Fromentel) (UJ 158P 57): calicular surface, slightly abraded; **C.** *Hydnophoromeandraraea volzi* Morycowa: view of upper part of hydnophoroid colony (UJ 158P 105); **D.** *Parnassomeandra diacantoniae* Morycowa n.gen, n.sp. Side view of colony (type species and holotype – UJ 158P 35)

Genus *Mixastraea* Roniewicz 1976
Type species: *Mixastraea danubica* Roniewicz 1976

Mixastraea westfalica Löser 1993
Fig. 36 (C–F)

1993a. *Mixastraea westfalica* Löser: p. 104, pl. 1, text-figs 1, 2.
1994. *Mixastraea westfalica* Löser: Löser, p. 40-42, pl. 7, fig. 3; pl. 12, fig. 12, text-figs 28-32.
1996. *Mixastraea westfalica* Löser: Baron-Szabo & Steuber, p. 26, pl. 14, figs 3, 4.
1999. *Mixastraea westfalica* Löser: Baron-Szabo & Gonzáles-León, p. 491, fig. 6d.

Material: 1 colony: UJ 158P 100, 3 thin sections: UJ 158P 100a-c.

Dimensions (in mm):

	No. 100,	Holotype: Löser, 1993a
D	40×ca 25	
H	ca 35	
d	10-14	6-13
c-c	8-14	(6) 9-10 (12)
S	60-ca 100	(55) 60-80 (100)
den s (wall reg.)	4-6/2	6/2
th S1 (outer zone) with pennulae	0.3	0.1-0.3
den pen (long. section)	5/2	5/2
den pen (transv.section)	3-4/1	
den cc (septa)	(2) 3-4/1	

Description: Massive, cerioid colony. Corallites subpolygonal, shallow, monocentric or bi-centric. Budding marginal with lamellar linkage. In such cases they are linked by biseptal blades. Septa are differentiated into three size orders. They are thin, irregularly porous, subequal or in places alternate in thickness, nonconfluent and subconfluent.The confluent septa occur between the newly de-

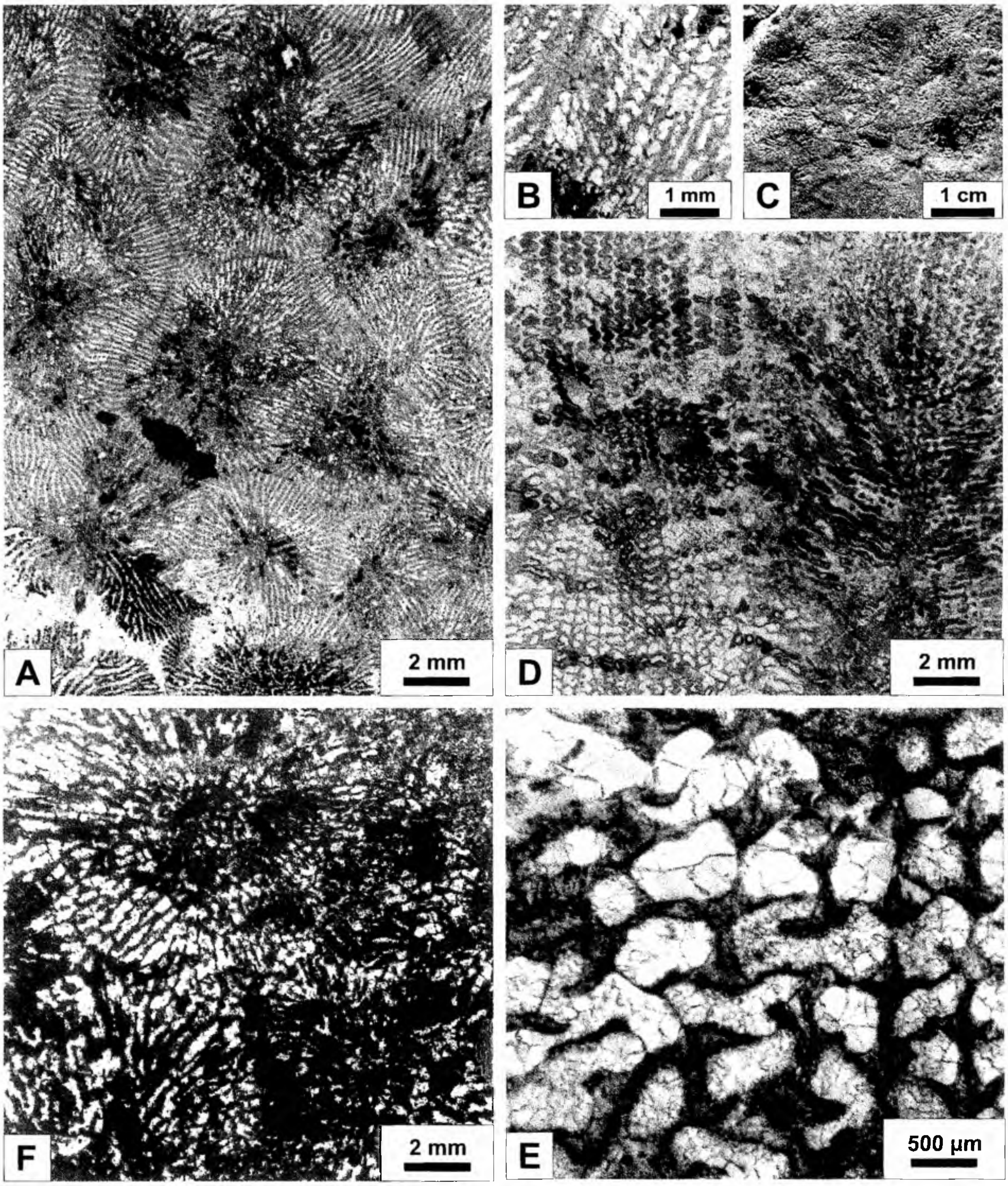

Fig. 36. A, B. *Mixastraea polyseptata* Morycowa n.sp., holotyp (UJ 158P 101): A – transverse thin section (UJ 158P 101a); B – longitudinal section (UJ 158P 101b); **C–F.** *Mixastraea westfalica* Löser: C – fragment of upper surface of colony showing shallow calices (specimen: UJ 158P 100); D – longitudinal section (UJ 158P 100b); E – enlarged detail of D showing pennules directed at not very acute angle to the septal blade; F – transverse thin section (UJ 158P 100a)

veloping individual. About 12–16, rarely 20, septa reach to the axis. Columella papillar, composed of trabecular projections (paliform lobes) of septa S1 and with central trabeculae visible in some well-preserved corallites.Wall incomplete, septothecal. Rare synapticulae occur in the outer zone of corallites. Endotheca formed by large, thin-walled dissepiments.

Microstructure: Trabeculae simple and branching.The diameters of main trabeculae observed in the transverse section are 200 to 300 µm.

Remarks: This specimen does not differs from the holotype presented by Löser (1993a).

Distribution:

Aptian – Central Greece, near Delfi-Arachova
Middle Albian – Mexico, Lampazos area
early Cenomanian – Germany, Westphalia

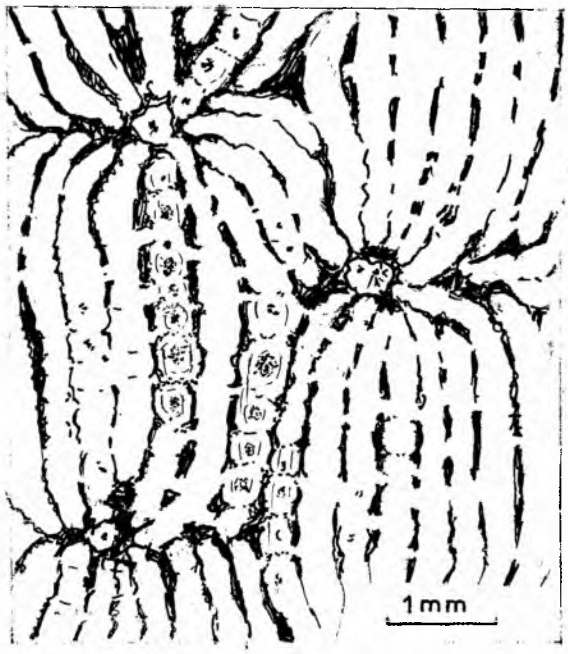

Fig. 37. *Stylomaeandra* sp. (UJ 158P 103a), Fragment of calicular series in transverse section, showing subequal in thickeness and parallelly arranged radial elements. Substyliform columella, irregularly porous radial elements with pennules and menianes are marked

Mixastraea polyseptata Morycowa new species
Fig. 17 (D, E), 36 (A, B)

Holotype: UJ 158P 101, Fig. 36 (A, B)
Type-level: Albian; Subpelagonian Unit, Parnassos area.
Type-locality: Agrostylia (Parnassos region in Central Greece).
Etymology: *polyseptata* (Greek: *polys*) – named after of numerous septa in corallites.
Diagnosis: Calicular diameter from 4.5 to 7 mm. About 70–100 septa differentiated into three or four size orders. Septal density: 4–6/1 mm. Density of pennules in longitudinal section: 5/2 mm, and endothecal elements ca 5–6/2 mm. Columella small, papillar.
Material: 2 specimens: UJ 158P101 and 102, 3 thin sections: UJ 158P 101a, b and 102a.
Dimensions (in mm):

D	No. 101: 20×50; No. 102: 30×40
H	No. 101: 30; No. 102: ca 35
d cor	4.5-7
S	to 70 (100)
den s	8-12/2
den end	5-6/2
den pen (long. section)	5/2
den cc (septa)	4-8/1

Description: Colonies massive, subcerioid. Budding intracalicinal marginal, with septal connections. Young individuals separated rapidly from the maternal form. Calices shallow. Radial elements subcompact, nonconfluent, subconfluent and rarely confluent, frequently anastomosed. They are thin, subequal or in large corallites alternating in thickness.

Septa arranged in three to five size orders, without distinct systems. From 12 to 16 first order septa reach to the center. Lateral surface with well developed pennules and menianes. Wall incomplete, septothecal. Rare synapticulae occur in the outer zone of corallites. Endothecal elements large, tabuloid, elevated in the outer zone and slightly concave in the central zone of the corallites
Microstructure: Septa composed of simple and compoud trabeculae, most frequently 120 to 250 µm in diameter.
Remarks: *Mixastraea polyseptata* n.sp. differs from *Mixastraea westfalica* Löser in smaller corallite diameters and in thinner, more numerous septa.

Genus *Stylomaeandra* de Fromentel 1877
Type species: *Stylomaeandra regularis* de Fromentel 1877

Stylomaeandra sp.
Figs 29 (F, G), 37

Material: 1 colony: UJ 158P 103; 3 thin sections: 158P 103a-c.
Dimensions (in mm):

	No. 103	*S. regularis* de Fromentel 1877 (1862b-1887), Pl. 113, fig. 3, 3a)	*S. pseudominima* Eguchi 1951 (1951 Pl. 9, fig. 1-60)
D	50×ca 60		
H	ca 27		
col-col	(5.5) 6-8.5	8-9	2.5-4
c-c in serie	3-6		2-3/2
S	12-18	24	13-16
th S	0.4-0.5		
den s	7-9/5	ca 13/5	4-5/2
den pen (long. sect.)	4-5/2		

Description: Lamellar, meandroid colony with upper surface poorly preserved. Calicular series long, parallel, shallow with distinct centres of corallites. The wall between the series is synapticular, discontinuous. On the upper surface of the colony it is expressed as low, wide, tholiform collines. The radial elements (biseptal lames) are thick, subequal, generally confluent between adjoining series. The corallites in the series connected in places by one or two septa. About 12 septa reaching to the centre of corallites. Perforation is frequent in the axial septal part. Lateral surface of radial elements with pennulae showing edges ornamented by granulations. Columella small, styliform. Budding intraserial.
Remarks: The specimen is similar to *S. regularis* from the Lower Aptian of South France (Sault, reg. Vaucluse; de Fromentel, 1877, pl. 113, figs 3, 3a; coll. de Fromentel: 3538) but differs from it in thicker and less numerous radial elements per corallites. In the original description de Fromentel (1877, p. 457) considers the columella to be big and styliform. The enlarged picture of this element shows that it is small but thickened by the separate trabecular elements of the internal edge of septa.

Eguchi (1951) described *Stylomaeandra pseudominima* from the Lower Cretaceous of Japan (Northern Honsyu), which however differs from *S. regularis* in narrower series and thinner and less numerous radial elements.

Alloiteau (1957, p. 301) and Eguchi (1951) placed *Stylomaeandra* in the Latomeandridae. It seems, however, that the radial elements of *Stylomaeandra regularis* and *Stylomaeandra* sp. are rather porous, and their subcompact appearance is the result of diagenetic processes. Thus, *Stylomaeandra* should perhaps be placed in the family Microsolenidae. A redescription of the type species on the basis of thin sections might help to solve this problem.

Family MICROSOLENIDAE Koby 1890

Genus *Hydnophoromeandraraea* Morycowa 1971
Type species: *Hydnophoromeandraraea volzi* Morycowa 1971

Hydnophoromeandraraea volzi Morycowa 1971
Fig. 35C

1971. *Hydnophoromeandraraea volzi* Morycowa; p. 124-125, pl. 33, fig. 4; pl. 34, fig. 1; pl. 36, fig. 2; text-fig. 36.
1994. *Hydnophoromeandraraea volzi* Morycowa; Masse & Morycowa, p. 443, pl. 3, figs 1a, b, 2a, b, 3a, b, 4.
1997. *Hydnophoromeandraraea volzi* Morycowa; Baron-Szabo, p. 85, pl. 14, fig. 4.

Material: 1 colony: UJ 158P 105, 1 thin section: UJ 158P 105a.
Dimensions (in mm):

D	65×70
H	45
l col	(2) 3-4
col-col	3-4 (5)
den s	3-4 (5)/1

Remarks: Thin lamellar colony with very short collines. The skeleton is poorly preserved. However, the diameter of collines and pennular, porous radial elements observed in places on the upper surface of the specimen allow to identify it as *H. volzi*.

The species of the genus *Hydnophoromeandraraea* Morycowa are known to date only from the Barremian and Aptian.
Distribution:
Barremian–Early Aptian – France, Provence (Barremian – La Fare and Orgon; Early Aptian – Massif du Mont-Ventoux)
Early Aptian – Romania, Carpathians, Rarău; Alps, Austria/Germany, Allgau Schrattenkalk

Subclass OCTOCORALLIA Haeckel 1866

Order COENOTHECALIA Bourne 1900
Family HELIOPORIDAE Moseley 1876

Genus *Pseudopolytremacis* Morycowa 1971
Type species: *Pseudopolytremacis spinoseptata* Morycowa 1971

Pseudopolytremacis spinoseptata Morycowa 1971
Fig. 23E

1971. *Pseudopolytremacis spinoseptata* Morycowa: p. 140, text-fig. 42, pl. 39, fig. 1; pl. 40, fig. 2.
1974. *Pseudopolytremacis spinoseptata* Morycowa: Turnšek & Buser, p. 25, pl. 14, fig.3.
1977. *Pseudopolytremacis spinoseptata* Morycowa: Morycowa, p. 20, pl. 3, fig. 5; pl. 4, figs 6-8.
1993b. *Pseudopolytremacis spinoseptata* Morycowa: Löser, p. 213, figs 1, 3, 4.2, 4.4, 4.6.
1994. *Pseudopolytremacis spinoseptata* Morycowa: Löser, p. 76, text-figs 62, 63, pl. 9, fig. 6.
?1997. *Pseudopolytremacis* cf. *spinoseptata* Morycowa: Baron-Szabo, p. 89-90, pl.15, fig. 6.

Material: 1 colony: UJ 158P 106; 3 thin sections: UJ 158P 106a-c.
Dimensions (in mm):

	No. 106	Morycowa, 1971 Holotype: UJ 124P 210
D of the branches	(3) 3.5-7×8-12 (18)	massive colony
H	to ca 20	
d	0.4-0.7 (0.8)	0.5-0.6
c-c	0.6-1.5 (2)	1.1-3.5
S (septal spines in the calicular rim)	12-16	14-16 (17)
den of coenenchyme tubes	4-5/1	5 (6)/1
den end	ca 2/1	2-4/1

Remarks: Fragments of subcylindrical branches of colonies. The diameter of calices, the density of coenenchymal tubes and the type of septal spines indicate *P. spinoseptata*. However, the calices in the specimen from Argostylia are arranged slightly more densely than in the holotype.

It is necessary to provide a revision of four species from the genus *Pseudopolytremacis*, with similar dimensions, i.e. *Pseudopolytremacis spinoseptata* Morycowa (Morycowa, 1971), *Pseudopolytremacis hanagensis* Kuzmicheva (Kuzmicheva, 1975), *Heliopora kysylkumensis* Kuzmicheva (Kuzmicheva, 1970; this species undoubtedly belongs to the genus *Pseudopolytremacis*) and Pseudopolytremacis paliformis Löser (Löser, 1993). It is not excluded that they are conspecific.

Distribution:
Barremian – Aptian: Slovenia, Osojnica
Early Aptian – Romania, Carpathians, Rarău
early Cenomanian – Germany, Westphalia and Saxony
?early Coniacian – Austria, Brandenberg Gosau (diameter of calices: 0.8–1 mm)

CONCLUSIONS

Shallow-water scleractinian corals from Cretaceous allochthonous sediments of the Subpelagonian Zone in Parnassos region (Agrostylia, Central Greece) represent 47 taxa belonging to 35 genera, 15 families and 8 suborders; of these 3 new genera and 9 new species are described. Among these taxa, 4 were identified only at the generic level. One octocorallian species has also been identified.

The Albian age of the corals discussed is indicated by the whole coral taxa (Fig. 6) and by associated foraminifers, calpionellids (*Colomiella recta* Bonet) and calcareous dinoflagellates, (e.g., *Cadosina semiradiata semiradiata* Wanner and *Colomisphaera leporis* Rehánek) (Reháková, 2000 and personal communication).

The coral assemblage is representative of the late Early Cretaceous Tethyan realm but also shows some endemism. A characteristic feature of this scleractinian coral assemblage is the abundance of specimens with neorhipidacanth microstructure, typical of the suborder Rhipidogyrina; among about 90 specimens, 22 represent rhipidogyrines (4 genera, 9 species and one specimen identified at the generic level only). Another distinct character of the assemblage is the absence of the species from such families as Stylinidae, Cyathophoridae and Thamnasteriidae, which constitute a very important component of most of the known Lower Cretaceous shallow-water coral assemblages.

The coral fauna from Agrostylia shows some similarity, on account of rather numerous, rhipidogyrine taxa, to shallow-water coral assemblages from the Albian in Abruzzi, Italy (two genera and nine species; Prever, 1909; age after Masse *et al.*, 1998), and in Georgia (seven genera and eight species; Sikharulidze, 1979a). Due to the presence of common species, the Agrostylian coral assemblage bears a certain resemblance to a shallow-water coral assemblages from the Aptian of Delfi-Arachova area, Greece (Baron-Szabo & Steuber 1996), Albian in Abruzzi, Italy (Prever, 1909) and the (?) Early Cenomanian of Panourgias, Giona region, Greece (Hackemesser, 1936).

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REFERENCES

Abdel-Gawad, G. I. & Gameil, M., 1995. Cretaceous and Palaeocene Coral Faunas in Egypt and Greece. *Coral Research Bulletin*, 4: 1–36, Dresden.

Alloiteau, J., 1941. Révision de collection H. Michelin. Polypiers d'Anthozoaires. I. Crétacé. *Mémoires du Muséum National d'Histoire Naturelle*, (N.S.), 16: 1–100.

Alloiteau, J., 1946-1947. Polypiers du gargasien aragonais. In: Hupé, P. & Alloiteau, J. (eds), *Annales de la Esquela de Peritos Agricolas y de Especialidades Agropecuarias y de los Servicios Técnicos de Agricultura*, 6: 187–243, Barcelona.

Alloiteau, J., 1948. Polypiers des couches albiennes à grandes Trigonies de Padern (Aude). *Bulletin de la Société Géologique de France*, 5 sér., 18: 699–738.

Alloiteau, J., 1952. Madréporaires post-paléozoïques. In: Piveteau, J. (ed.), *Traité de Paléontologie*, 1: 539–684, Paris.

Alloiteau, J., 1954. Le genre *Actinastrea* d'Orbigny 1848 dans le Crétacé supérieur francais. *Annales Hébert et Haug*, 8: 1–104, Paris.

Alloiteau, J., 1957. Contribution à la systématique des Madréporaires fossiles. Thèse, *Centre National de Recherche Scientifique*, 2 vols: 462 pp., Paris.

Alloiteau, J., 1958. Monographie des Madréporaires fossiles de Madagascar. *Annales géologiques de Madagascar*, 25: 218 pp., Tananarive.

Alloiteau, J. & Dercourt, J., 1966. Données nouvelles sur les polypiers de l'Argolide Septentrionale (Grèce). *Annales géologiques des pays helléniques*, 17: 298–342.

Angelis d'Ossat, G., 1905a. Coralli del Cretacico inferiore della Catalogna. *Palaeontographia Italica*, 9: 169–251.

Angelis d'Ossat, G., 1905b. I Coralli del calcare de Venassino (Isola de Capri). *Atti della Reale Accademia delle Scienze fisiche e matematiche di Napoli*, 12: 1–45.

Aubouin, J., 1958. Essai sur l'evolution paléogéographique et developpement tecto-orogénique d'un système géosynclinal: le secteur grec des Dinarides (Hellenides). *Bulletin de la Société Géologique de France*, 8: 731–749.

Babaev, R. G., 1964. On new Upper Jurassic hexacorals from Azerbaidjan. (In Russian). *Paleontologicheskiy zhurnal*, 4: 31–37, Moskwa.

Baron-Szabo, R. C., 1993. Korallen der höheren Unterkreide ("Urgon" von Nordspanien, Playa de Laga, Prov. Guernica). *Berliner geowissenschaftliche Abhandlungen* (E), 9: 47–181.

Baron-Szabo, R. C., 1997. Die Korallenfazies der ostalpen Kreide (Helvetikum: Allãuer Schrattenkalk; Nördliche Kalkalpen: Brandenberger Gosau) Taxonomie, Paleökologie. *Zitteliana*, 21: 3–97.

Baron-Szabo, R. C., 1998. A new coral fauna of the Campanian from north Spain (Torallola village, Prov. Lleida). *Geologisch-palaontologische Mitteilungen Innsbruck*, 23: 171–235.

Baron-Szabo, R. C., 1999. Taxonomy of Upper Cretaceous scleractinian corals of the Gosau Group (Weissenbachalm, Steiermark, Austria). *Abhandlungen der Geologischen Bundesanstalt*, 56: 441–464.

Baron-Szabo, R. C. & Fernandez-Mendiola, P.A., 1997. Cretaceous scleractinian corals from the Albian of Cabo de Ajo (Cantabria province, N-Spain). *Palaontologische Zeitschrift*, 71: 35–50.

Baron-Szabo, R. C. & Gonzales-León, C. M., 1999. Lower Cretaceous corals and stratigraphy of the Bisbee Group (Cerro de Oro and Lampazos areas), Sonora, Mexico. *Cretaceous Research*, 20: 465–497.

Baron-Szabo, R. C. & Steuber, T., 1996. Korallen und Rudisten aus dem Apt im Tertiaren Flysch des Parnass Gebirges bei Delfi-Arachova (Mittelgriechenland). *Berliner geowissenschaftliche Abhandlungen* (E), 18: 3–75.

Bataller, J. R., 1937. La fauna corallina del cretacico de Catalunya i regions limitrofes. *Arxius de l'Escola Superior d'Agricultura*, (N. S.), 3: 1–299, Barcelona.

Bataller, J. R., 1947. Sinopsis de las especies nuevas del cretácico de Espana. *Memorias de la Real Academia de Ciencias y Artes de Barcelona*, 28: 318–391.

Beauvais, L., 1970. Donnés nouvelles sur le sous-ordre Amphiastraeida Alloiteau. *Comptes rendus hebdomadaires des séances de l'Académie des Sciences*, 271: 34–37, Paris.

Beauvais, L., 1974. Studies upon the characters of the suborder Amphiastraeida Alloiteau, *Ancient Cnidaria*, 1: 238–248, Nauka, Novosibirsk.

Beauvais, L., 1976. Madréporaires du jurassique. Etude morphologique, taxonomique et phylogénétique du sous-ordre *Amphiastraeida* Alloiteau. *Mémoire de la Société Géologique de France* (N.S.), 55: 5–42.

Beauvais, L. & Bernier, P., 1981. Nouvelles espèces de Madréporaires dans le kimmeridgien supérieur du Jura (France). *Géo-*

bios, 14: 173–189.

Beauvais, M., 1977. Le nouveau sous-ordre des Heterocoeniida. In: *Second International Symposium on Corals and Coral Reefs 1975. Mémoires du Bureau de Recherches Géologiques et Minières*, 89: 271–282, Paris.

Beauvais, M., 1982. Révision systématique des Madréporaires des couches de Gosau (Crétacé supérieur, Autriche). *Travaux du Laboratoire de Paléontologie des Invertébrés, Université Pierre et Marie Curie*, 3: 1–177, Paris.

Becker, E., 1875. Die Korallen der Nattheimer Schichten (1). *Palaeontographica*, 21: 1–60.

Bendukidze, N. S., 1961. To the study of the Lower Cretaceous corals from the Crimea (In Russian). *Trudy Geologicheskogo Instituta AN Gruzinskoj SSR*, 12: 5–40.

Brunn, J., 1956. Contribution à l'étude géologique du Pinde septentrional et de la Macedoine occidentale. *Annales Géologiques des Pays Helléniques*, 7: 1–358.

Bugrova, I., 1990.The facies zonation and scleractinians of the Early Hauterivian reef complex of Bolshoj Balkhan. *Cretaceous Research*, 11: 229–336.

Celet, P., 1962. Contribution ŕ l'étude géologique du Parnase-Kiona et d'une partie des régions méridionales de la Grèece continentale. *Annales Géologiques des Pays Helléniques*, 13: 1–446.

Chevalier, J.-P., 1961. Recherches sur Madréporaires et les formations récifales miocènes de la Méditerranée Occidentale. Thèse, *Mémoire de la Societé Géologique de France* , 40, no. 93: 1–252.

Chevalier, J.-P., 1971. Les Scléractiniaires de la Mélanésie Française (I[re] partie). *Expédition française sur les récifs coralliens de la Nouvelle-Calédonie organisée sous l'égide de la Fondation Singer-Polignac*, 4: 7–307, Paris.

Chevalier, J.-P., 1987. Ordre des Scléractiniaires, In: *Traité de Zoologie*, 3, 3: 403–764. Masson, Paris.

Császár, G. & Turnšek, D., 1996. Vestiges of atoll-like formations in the Lower Cretaceous of the Mecsek Mountains, Hungary. *Cretacous Research*, 17: 419–442.

Cuif, J. P., 1972. Note sur des Madréporaires triassiques à fibres aragonitiques conservées. *Comptes rendus des seances de l'Academie des Sciences*, D, 274: 1272–1275.

Cuif, J. P., 1975. Caractères morphologiques, microstructuraux et systématiques des Pachythecalidae nouvelle famille de Madréporaires triassiques. *Géobios*, 9: 157–180.

Cuif, J. P. & Dauphin, Y., 1998. Microstructural and physicochemical characterization of "centers of calcification" in septa of some Recent scleractinian corals. *Paläontologische Zeitschrift*, 72: 257–270.

Cuif, J.-P., Perrin, C., Tilliere, A. & Tillier, S., 1999. Coral morphology and microstructure versus soft tissue DNA sequencing: A new database for the systematics of Scleractinia. Abstract. *8[th] International Symposium on Fossil Cnidaria and Porifera, September 12-16, 1999, Sendai, Japan*: 109.

Cuif, J.-P. & Sorauf, J. E., 2001. Biomineralization and diagenesis in the Scleractinia: part I, biomineralization. *Bulletin of the Tohoku University Museum*, 1: 144–151.

Dietrich, W. O. 1926. Steinkorallen des Malms und der Unterkreide im stüdlichen Deutsch-Ostafrica. *Palaeontographica*, 7: 43–101.

Eguchi, M., 1936. Tree new genera of corals from the Lower Cretaceous of Japan. *Proceedings of the Imperial Academy of Japan Tokyo*, 12: 70–72.

Eguchi, M., 1951. Mesozoic Hexacorals from Japan. *Science Reports of the Tohoku Imperial University* (2: Geology), 24: 1–96, Sendai.

Eliášová, H., 1973. Sous-famille Rhipidogyrinae Koby, 1905 (Hexacorallia) des calcaires de Štramberk (Tithonien, Tchécoslovaquie). *Časopis pro mineralogii a geologii*, 18: 276–287.

Eliášová, H., 1975. Sous-ordre Amphiastraeina Alloiteau, 1952 (Hexacorallia) des calcaires de Štramberk (Tithonien, Tchécoslovaquie). *Časopis pro mineralogii a geologii*, 20: 1–23.

Eliášová, H., 1976. Les coraux de l'ordre Hexactiniaria Montanaro Gallitelli, 1975, Zoantharia de Blainville, 1830 dans les calcaires de Štramberk (Tithonien, Tchécoslovaquie). *Vestnik Českeho geologickeho ustavu*, 51: 357–366.

Eliášová, H., 1978. La redéfinition de l'ordre Hexactiniaria Montanaro Gallitelli, 1975 (Zoantharia). *Vestnik Českeho geologickeho ustavu*, 53: 89–101.

Eliášová, H., 1981. Sous-ordre Stylinina Alloiteau, 1952 (Hexacorallia) des calcaires de Štramberk (Tithonien , Tchécoslovaquie). *Sbornik geologickych ved, Paleontologie*, 24: 117–133.

Eliášová, H., 1990. Coraux des calcaires d'Ernstbrunn (Jurassique supérieur–Crétacé inférieur) dans les Carpathes externes, zone de Waschberg, Tchécoslovaquie. *Časopis pro mineralogii a geologii*, 35: 113–134.

Eliášová, H., 1994. Latomeandrides (Scléractiniaires) du Crétacé supérieur de Bohême (République tchèque). *Vestnik Českeho geologickeho ustavu*, 69: 1–16.

Eliášová, H., 1997a. Coraux pas encore décrits ou redécrits du Cretacé supérieur de Bohême. *Vestnik Českeho geologickeho ustavu*, 72: 61–80.

Eliášová, H., 1997b. Coraux Crétacés de Bohême (Cénomanien supérieur; Turonien inférieur Coniacien inférieur), République tchèque. *Vestnik Českeho geologickeho ustavu*, 72: 245–266.

Errenst, C., 1990. Das korallenführende Kimmeridgium der nordwestlichen iberischen Ketten und angrenzenden Gebiete (1), *Palaeontographica*, (A), 214: 121–207.

Felix, J., 1903. Studien über die korallenfuhr enden Schichten der oberen Kreideformation in den Alpen und den Mediterrangebieten (1) Die Anthozoen der Gosauschichten in den Ostalpen. *Palaeontographica*, 49: 163–360.

Fromentel, E. de, 1857. Description des Polypiers fossiles de l'étage Néocomien. *Bulletin de la Societé des Sciences Historiques et Naturelles de l'Yonne*, 1–78, Auxerre.

Fromentel, E. de, 1861. Introduction à l'étude des polypiers fossiles. *Mémoires de la Societé d'émultion du département du Doubs*, (3), 5: 357 pp., Besançon.

Fromentel, E. de, 1862a. In Gras, S. (ed.), *Description géologique du département de Vaucluse*, 429–431, Paris.

Fromentel, E. de., 1862b-1887. Zoophytes, Terrain crétacés. In: d'Orbigny, A. (ed.), *Paléontologie Française*, 8: 1–624, Masson, Paris.

Gameil, M., 1997. Cretaceous corals of Gabal Mokattab, West Central Sinai, Egypt. *Egyptian Journal of Geology*, 41, 2A: 347–363, Cairo.

Geyer, O. F., 1955. Beitrage zur Korallenfauna des Stramberger Tithon. *Paläontologische Zeitschrift*, 29: 177–216.

Gill, G. A., 1967. Quelques precisions sur les septes perforés des polypiers mésozïoques. *Mémoires de la Societé Géologique de France*, nov. sér., 106: 57–83.

Gill, G. A., 1970. Structure et microstructure septale de *Montlivaltia* Lmx.: critères nouveau pour la systématique des hexacoralliaires. *Comptes Rendus des séances de l'Académie des Sciences* (D), 270: 294–297.

Gill, G. A., 1977. Essai de regroupement des Stylinides (hexacoralliaires) d'après la morphologie des bords de leurs septes. *Second International Symposium on Corals and Coral Reefs 1975. Mémoires du Bureau de Recherches Géologiques et Minières*, 89: 283–295.

Hackemesser, M., 1936. Eine kretazische Korallenfauna aus Mittel-Griechenland und ihre palão-biologischen Beziehungen. *Palaeontographica* (A), 84: 1–97.

Hackemesser, M., 1937. Neue Korallenfunde aus den mittelgriechischen Hochgebirgen. *Leipziger Vierteljahresschrift für Südosteuropa*, 2: 45–57, Leipzig.

Jell, J. S., 1969. Septal microstructure and classification of the Phillipsastreidae. In: Campbell, K. S. (ed.). *Stratigraphy and Palaeontology. Essays in Honour of Doroty Hill*: 50–73. Australian National University Press, Canberra.

Khalilov, A. G., Aliev, G. A., Kuzmicheva, E. I. & Askerov, R. B., 1977. The Urgonian complex of the Bazarchay River Basin (Malyy Kavkaz). (In Russian). *Byuletin Moskovskogo Obshestva Ispytatelly Prirody, Oddel Geologicheskiy*, 52, 4: 85–93, Moskwa.

Koby, F., 1896-1898. Monographie des Polypier crétacés de la Suisse. *Mémoires de la Societé paléontologique Suisse*, 22-24: 1–100.

Kołodziej, B., 1995. Microstructure and taxonomy of Amphiastraeina (Scleractinia). *Annales Societatis Geologorum Poloniae*, 65: 1–17.

Kranis, H. D. & Papanikolaou, D. I., 2001. Evidence for detachment faulting on the NE Parnassos mountain front (Central Greece). *Bulletin of the Geological Society of Greece*, 34: 281–287.

Kruglov, S. S. & Kuzmicheva, E. I., 1968. New data on the coral fauna of Marmarosh Klippes (Transcarpathian). (In Russian). *Paleontologicheskij Sbornik*, 5: 58–62, Lvov.

Kuzmicheva, E. I., 1960. Shestiluchevyje korally. *Atlas niznemelovoj fauny severnego Kavkaza Kryma*, 125–141, Moskwa.

Kuzmicheva, E. I., 1970. First discoveries of the Early Cretaceous corals *Heliopora* and *Polytremacis* in the USSR. (In Russian). In: Sokolov, B. S. (ed.): *Mezozoyskie korally SSSR, Trudy*, 2: 93–100.

Kuzmicheva, E. I., 1975. O sistematicheskom sostave i razvitii semejstva Helioporidae (vosmilychevye korally); (On the taxonomic composition and development of the family Helioporidae (Octocorals)). (In Russian, English summary). *Paleontologicheskiy Zhurnal*, 3: 11–17.

Kuzmicheva, E. I., 1980. Korally (Corals). (In Russian). In: Czernov, V., Yanin, B. & Golovinova, M. (eds), *Urgonskie otlozheniya sovetskikh Karpat*: 90–108, Nauka, Moskwa.

Kuzmicheva, E. I., 1987. Corals from Lower Barremian organogenous buildups of the Malyj Balkhan and Tuarkyr. (In Russian). In: *Geologicheskie stroenie Turkmenii*. Akademija Nauk Turkmenskoj SSR, 217–262, Ashkhabad.

Kuzmicheva, E. I., 1988. Korally (Corals). In: Aliev, M., Ali-Zade, A. & Alujulla, K. (eds), *Cretaceous fauna of Azerbaidjan*. (In Russian). *Akademia Nauk Azerbajdjana* SSR: 153–183, Baku.

Kühn, O. & Andrusov, D., 1930. Korály bradlového obalu Karpat. *Vestnik Státniho geologického ústavu Československé Republiky*, 6: 155–168.

Lathuiličre, B., 1996. Is morphology a good way to understand the evolution of corals? *Paleontological Society Papers*, 1: 81–105.

Liao, Weihua, 1982. Mesozoic Scleractinian corals from Xizang. In: The Series of the Scientific Expedition to the Qinghai-Xizang Plateau. *Palaeontology of Xizang*, 4: 152–183, Beijing.

Liao, Weihua & Xia, Jinbao, 1985. Upper Jurassic and Lower Cretaceous Scleractinia from Bangoin district of northern Xizang (Tibet). *Memoirs of the Nanjing Institute of Geology and Palaeontology*, 21: 119–174.

Liao, Weihua & Xia, Jinbao, 1994. Mesozoic and Cenozoic scleractinian corals from Tibet. *Palaeontologia Sinica*, 184 (New Ser. B), 31: 1–252.

Löser, H., 1987. Zwei neue Gattungen der Korallen aus der Sächsischen und Böhmischen Oberkreide. *Vestnik Ústredniho ústavu geologického*, 62: 233–237.

Löser, H., 1989. Die Korallen der Sächsischen Oberkreide. Teil I: Hexacorallia aus dem Cenoman. *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie zu Dresden*, 36: 88–154, 183–186, 209–215.

Löser, H., 1993a. Morphologie und Taxonomie der Gattung *Mixastraea* Roniewicz, 1976 (Scleractinia, Jura–Kreide). *Berliner geowissenschaftliche Abhandlungen*, (E) 9: 103–109.

Löser, H., 1993b. Morphologie und Taxonomie der Gattung *Pseudopolytremacis* Morycowa, 1971 (Octocorallia; Kreide). In: Oekentorp-Küster, P. (ed.), *Proceedings of the VI International Symposium on Fossil Cnidaria and Porifera, Münster, Germany 9-14 September 1001. Courier Forschungsinstitut Senckenberg*, 164: 211–220.

Löser, H., 1994. La fauna corallienne du mont Kassenberg à Mulheim-sur-la-Ruhr (Bassin Crétacé de Westphalie, Nord Ouest de l'Allemagne). *Coral Research Bulletin*, 3: 1–91, Dresden.

Löser, H., 1995. Aptian/Albian coral assemblages of the Helicon Mountains (Boeotia, Greece): palaeontological, palaeoecological and palaeogeographical aspects. *Coral Research Bulletin*, 4: 37–63, Dresden.

Löser, H., 1998a. Remarks on the Aulastraeoporidae and the genus Aulastraeopora (Scleractinia; Cretaceous) with the description of a new species. *Abhandlungen und Berichte für Naturkunde*, 20: 59–75.

Löser, H., 1998b. Die korallen der Sächsichen Oberkreide eine Zwischenbilanz und Bemerkungen zu Korallenfauna des Cenomans. *Abhandlungen des Staatlichen Museums für Mineralogie und Geologie zu Dresden*, 43/44: 173–187.

Löser, H., 1998c. Cretaceous corals – state of knowledge and current research. *Zentralblatt für Geologie und Paläontologie, Teil I*, 11/12: 1475–1485.

Löser, H., 1999. UpperCretaceous Corals from the Ptoon Mountains (Central Greece). *Abhandlungen und Berichte für Naturkunde*, 21: 49–61.

Löser, H. & Raeder, M., 1995. Aptian/Albian coral assemblages of the Helicon Mountains (Boeotia, Greece): palaeontological, palaeoecological and palaeogeographical aspects. *Coral Research Bulletin*, 4: 37–63, Dresden.

Maps IGME: Sheet AMPHISA, 1:50 000, 1960.

Marcović, O., 1951. Mesozoic corals from Serbia.1: Aptian corals of the region near the village Sukovo (eastern Serbia) (in Serbian). *Zbornik radova Srpska Akademija Nauk (S.A.N.), Geoloski Institut*, 16, 2: 181–193, Beograd.

Masse, J.-P. & Morycowa, E., 1994. Les scléractiniaires hydnophoroides du Crétacé inférieur (Barrémien-Aptien inférieur) de Provence (S.E. de la France). Systématique, stratigraphie et paléobiogéographie. *Géobios*, 27: 433–448.

Masse, J.-P. & Uchman, A., 1997. New biostratigraphic data on the Early Cretaceous platform carbonate of the Tatra Mountains. *Cretaceous Research*, 18: 713–729.

Masse, J.-P., Gallo Maresca, M. & Luperto Sinni, E., 1998. Albian rudist faunas from southern Italy: taxonomic, biostratigraphic and palaeobiogeographic aspects. *Geobios*, 31: 47–59.

Melnikova, G. K. & Roniewicz, E., 1976. Contribution to the systematics and phylogeny of Amphiastraeina (Scleractinia). *Acta Palaeontologica Polonica*, 21: 97–114.

Milne Edwards, H., 1857-1860. Histoire naturelle des Coralliaires, vol.: I-III, Atlas, Paris.

Milne Edwards, H. & Haime, J., 1848. Recherches sur les polypiers (4). Monographie des Astréides (1) Eusmiliens. *Annales de Sciences naturalles*. 10: 209–320.

Mitzopoulos, M., 1959. Erster Nachweis von Gosauschichten in Griechenland (Vermiongebirge). *Österreichische Akademie der Wissenschaften, Sitzungsberichte*, 168: 79–93.

Montanaro-Gallitelli, E., 1974. Biochemistry of Triassic Coelenterata. In: Sokolov, B. S. (ed.), *Ancient Cnidaria*, I., *Trudy, Institut geologii and geofiziki. Sibirskoe otd. AN SSSR*, 201: 61–62, Novosibirsk.

Montanaro-Gallitelli, E., 1975. Hexactiniaria a new Ordo of Zoantharia (Anthozoa, Coelenterata). *Bullettino dela Societŕ Paleontologica Italiana*, 14: 35–39.

Montanaro-Gallitelli, E., Morandi, N. & Pirani, R., 1973. Corallofauna triassica aragonitica ad alto contenuto in stronzio: studio analitico e considerazioni. *Bullettino dela Societŕ Paleontologica Italiana*, 12: 130–144.

Mori, K. & Minoura, K., 1980. Ontogeny of epithecal and septal structures in scleractinian corals. *Lethaia*, 13: 321–216.

Morycowa, E., 1964. Hexacoralla des couches de Grodziszcze (Néocomien, Carpathes). *Acta Palaeontologica Polonica*, 9: 3–114.

Morycowa, E., 1971. Hexacorallia et Octocorallia du Crétacé inférieur de Rarau (Carpathes Orientales roumaines). *Acta Palaeontologica Polonica*, 16: 3–149.

Morycowa, E., 1977. L'ultra-microstructure du squelette des Helioporidae fossiles (Octocorallia). In: *Second International Symposium on Corals and Coral Reefs 1975. Mémoires du Bureau de Recherches Géologiques et Miničres*, 89: 12–25, Paris.

Morycowa, E., 1980. Preservation of skeletal microstructure in fossil Scleractinia. *Acta Palaeontologica Polonica*, 25: 321–326.

Morycowa, E., 1989. Class Anthozoa Ehrenberg, 1834. In: Malinowska, L. (ed.), *Geology of Poland*, 3, 2c, Mesozoic, Cretaceous: 58–67, Warszawa.

Morycowa, E., 1997. Some remarques on *Eugyra* de Fromentel, 1857 (Scleractinia, Cretaceous). *Bol. R. Soc. Esp. Hist. Nat., (Sec. Geol.)*, 91: 287–295.

Morycowa, E. & Lefeld, J., 1966. Les Madréporaires des calcaires urgoniens de la série haut-tatrique dans la Tatra Polonaise. *Rocznik Polskiego Towarzystwa Geologicznego*, 36: 519–542.

Morycowa, E. & Decrouez, D., 1993. Description de quelques coraux des calcaires urgoniens de la chaine du Bargy (domaine delphino-helvétique, massif des Bornes, France). *Revue de Paléobiologie*, 12: 203–215.

Morycowa, E., Kołodziej, B. & Marcopoulou-Diacantoni, A., 1999. Albian Scleractinia from the Parnassos region (Central Greece). Abstract. *8th International Symposium on Fossil Cnidaria and Porifera, September 12-16, 1999, Sendai, Japan*: 108.

Morycowa, E. & Kołodziej, B. 2001. Skeletal microstructure of the Aulastraeoporidae (Scleractinia, Cretaceous). *Bulletin of the Tohoku University Museum. Proceedings of the 8th International Symposium on Fossil Cnidaria and Porifera*, [September 12-16, 1999, Sendai, Japan]: 187–192.

Morycowa, E. & Marcopoulou-Diacantoni, A., 1997. Cretaceous Scleractinian corals from the Parnassos area (Central Greece) (Preliminary note). *Bulletin of the Geological Society of Greece. Proceedings of the 7th Congress, May, 1994, Thessaloniki*: 249–273.

Morycowa, E. & Masse, J.-P., 1998. Les scléractiniaires du Barrémien-Aptien inférieur de Provence (SE de la France). *Géobios*, 31: 725–766.

Morycowa, E., Masse, J.-P., Arias, C. & Vilas, L., 2001. *Montlivaltia multiformis* Toula (Scleractinia) of the Prebetic domain (SE Spain). *Revista Espanola de Paleontologia*, 16: 131–144.

Morycowa, E. & Roniewicz, E., 1990. Revision of the genus *Cladophyllia* and descrition of Apocladophyllia gen.n. (Cladophyllidae fam. n., Scleractinia). *Acta Palaeontologica Polonica*, 35: 165–190.

Morycowa, E. & Roniewicz, E., 1994. Scleractinian septal microstructure. Taxonomical aspect. Abstract. In: *Coral Reefs in the past, present and future. Second European Regional Meeting, Luxembourg 1994*: 94.

Morycowa, E. & Roniewicz, E., 1995. Microstructural disparity between Recent fungiine and Mesozoic microsolenine scleractinians. *Acta Palaeontologica Polonica*, 40: 361–385.

Neuweiler, F., 1995. Dynamische Sedimentationsvorgänge, Diagenese und Biofazies unterkretazischer Plattformränder (Apt/Alb; Soba-Region, Prov. Cantabria, N-Spanien). *Berliner geowissenschaftliche Abhandlungen* (E) 17: 1–235.

Ogilvie, M., 1896. Microscopic and systematic study of madreporarian types of corals. *Philosophical Transactions of the Royal Society*, B 187: 83–345.

Ogilvie, M., 1897. Die Korallen der Stramberger Schichten. *Palaeontographica*, Abt. A, 7, Suppl. 2: 73–282.

Oppenheim, L. P., 1930. *Die Anthozoen der Gosauschichten in den Ostalpen*. Berlin, 604 pp.

Orbigny, A. (de), 1850. *Prodrôme de Paléontologie stratigraphique universelle des animaux mollusques et rayonnés*, 2. Paris, 428 pp.

Perrin, Ch. & Cuif, J. P., 2001. Ultrastructural controls on diagenetic patterns of scleractinian skeletons: evidence at the scale of colony lifetime. *Bulletin of the Tohoku University Museum. Proceedings of the 8th International Symposium on Fossil Cnidaria and Porifera*, [September 12-16, 1999, Sendai, Japan]: 210–218.

Počta, F., 1887. Die Anthozoen der böhmischen Kreideformation. *Abhandlungen der Koniglichen Böhmischen Gesellschaft der Wissenschaften*, 2: 1–60, Praha.

Prever, L., 1909. Anthozoa. In: Parona, C.F. (ed.), *La fauna coralligena del Cretaceo dei Monti d'Ocre nell'Abruzzo Aquilano. Memorie descrittive della carta geologica d'Italia*, 5: 51–147.

Prinz P., 1991. Mesozoische Korallen aus Nordchile. *Palaeontographica* Abt. A, 216: 147–209.

Reháková, D., 2000. Evolution and distribution of the Late Jurassic and Early Cretaceous calcareous dinoflagellates recorded in the Western Carpathian pelagic carbonate facies. *Mineralia Slovaca*, 32: 79–88.

Reig Oriol, J. M., 1991. *Fauna coralina cretácica del nordeste de España*, Barcelona, 5–50.

Reig Oriol, J. M., 1994. El género *Eugyra* en el Cretácico del nordeste Español. *Batalleria*, 4 (for 1990-1993): 3–36.

Reig Oriol, J. M., 1995. *Madreporarios Cretácicos*, Barcelona, 7–62.

Reig Oriol, J. M., 1997. *Géneros y especies nuevas de Madreporarios Cretácicos*, Barcelona, 7–45.

Renz, C., 1930. Neue mittelkretazische Fossilvorkommen in Griechenlands. *Zeitschrift Deutsche Geologische Gesellschaft*, 64: 437–465.

Reuss, A. E., 1854. Beiträge zur Charakteristik der Kreideschichten in den Ostalpen, besonders in Gosauthale und am Wolfgangsee. *Denkschriften Akademie Wissenschaften, Mathematisch-naturwissenschaftliche Klasse*, 7: 1–157.

Reyeros de Castillo, M. A., 1983. Corales de algunas formaciones cretacicas del Estado de Oaxaca. *Paleontologia Mexicana*, 47: 1–66.

Romano, S. L, 1996. A molecular perspective on the evolution of scleractinian corals. In: Stanley, G. D., Jr. (ed.), *The Paleonto-*

logical Society Papers, 1, Paleobiology and biology of corals: 39–57, Pittsburgh.

Romano, S. L. & Palumbi, S. R., 1996. Evolution of Scleractinian Corals Inferred from Molecular Systematics, *Science*, 271: 640–642.

Roniewicz, E., 1966. Les madréporaires du Jurassique supérieur de la bordure des monts de Sainte-Croix, Pologne. *Acta Palaeontologica Polonica*, 11: 157–264.

Roniewicz, E., 1970. Scleractinia from the Upper Portlandian of Tisbury, Wiltshire, England. *Acta Palaeontologica Polonica*, 15: 519–537.

Roniewicz, E., 1976. Les scléractiniaires du Jurassique supérieur de la Dobrogea centrale, Roumanie. *Palaeontologia Polonica*, 34: 17–121.

Roniewicz, E., 1984. Aragonitic Jurassic corals from erratic boulders on the south Baltic coast. *Annales Societatis Geologorum Poloniae*, 54: 65–77.

Roniewicz, E., 1989. Triassic scleractinian corals of the Zlambach Beds, Northern Calcareous Alps, Austria. *Österreichische Akademie der Wissenschaften, Mathematisch-Naturwissenschaftliche Klasse*, 126: 5–152.

Roniewicz, E. & Morycowa, E., 1993. Evolution of the Scleractinia in the light of microstructural data. In: Oekentorp-Künster, P. (ed.), *Proceedings of the VI. Interntional Symposium on Fossil Cnidaria and Porifera held in Münster, Germany 9-14 September 1991. Courier Forschungsinstitut Senckeenberg*, 164: 233–240.

Roniewicz, E. & Stolarski, J., 1999. Evolutionary trends in the epithecate scleractinian corals. *Acta Palaeontologica Polonica*, 44: 131–166.

Roniewicz, E. & Stolarski, J., 2001. Triassic roots of the amphiastraeid scleractinian corals. *Journal of Palaeontology*, 75: 34–45.

Sanders, D. & Baron-Szabo, R. C., 1997. Coral-Rudist Bioconstructions in the Upper Cretaceous Haidach Section (Gosau Group; Northern Calcareous Alps, Austria). *Facies*, 36: 69–90.

Schöllhorn, E., 1998. Geologie und Paläontologie des Oberapt im Becken von Organya (Nordspanien). *Coral Research Bulletin*, 6: 1–139, Dresden.

Scott, W. & Gonzales-León, C. 1991. Paleontology and biostratigraphy of Cretaceous rocks, Lampazos area, Sonora, Mexico, Special Papers. *Geological Sociaty of America*, 254: 51–67.

Sikharulidze, G. Y., 1977. Early Cretaceous Hexacorals of Georgia. (In Russian). Paleontologia i stratigrafia mezozojskich otlozenij Gruzji. *Trudy Geologicheskogo Instituta AN Gruzinskoj SSR*, n. ser., 58: 66–109.

Sikharulidze,G. Y., 1979a. Albian corals near the Tskhanar (Western Georgia). (In Russian). *Trudy Geologicheskogo Instituta AN Gruzinkoj SSR*, 63: 1–49.

Sikharulidze, G. Y.,1979b. The corals of the urgonian facies of Georgia. *Géobios, Mémoire spécial*, 3: 301–304.

Sikharulidze, G., 1985. Hexacorally urgonskoj facji Dzirulskowo Massiwa i jego siewiernogo obramlenia. (In Russian). *Trudy Geologicheskogo Instituta AN Gruzinkoj SSR*, nov. ser., 88: 3–78, Tbilisi.

Sorauf, J. E., 1978. Original structure and composition of Permian rugose and Triassic scleractinian corals. *Palaeontology*, 21: 321–339.

Sorauf, J. E., 1980. Biomineralization, structure and diagenesis of the coelenterate skeleton. *Acta Palaeontologica Polonica*, 25: 327–343.

Stolarski, J., 1995. Ontogenetic development of the thecal structures in caryophylline scleractinian corals. *Acta Palaeontologica Polonica*, 40: 19–44.

Stolarski, J., 1996. Gardineria – a scleractinian living fossil. *Acta Palaeontologica Polonica*, 41: 339–367.

Stolarski, J. & Roniewicz, E., 2001. Towards a new synthesis of evolutionary relationships and classification of Scleractinia. *Journal of Paleontology*, 75: 1090–1108.

Stolarski, J. & Russo, A., 2001.Evolution of the post-Triassic pachythecaliine corals. *Bulletin of the Biological Society of Washington*, 10: 242–256.

Stoliczka, F., 1873. The corals or Anthozoa from the Cretaceous rocks of South India. Memoirs of the Geological Survey of India. *Palaeontologia Indica*, 8: 130–202.

Toula, F., 1889. Geologische Untersuchungen im centralen Balken. *Denkschriften der Akademie der Wissenschaften, Mathematisch-Physikalische Klasse*, 55: 1–108.

Turnšek, D., 1997. *Mesozoic Corals of Slovenia*. Zalozba ZRC, 16: 512 pp.

Turnšek, D. & Buser, S., 1974. Spodnjekredne korale, hidrozoji in hetetide z Banjške Planate in Trnovskega Gozda (The Lower Cretaceous Corals, Hydrozoans and Chaetetids of Banjška Planota and Trnowski Gozd). *Razprave, Slovenska akademija znanosti in umetnosti*, 17: 83–124.

Turnšek, D. & Buser, S., 1976. Knidaryjska fauna iż senonijske breče na Banjški Planoti (Cnidarian fauna from the Senonian breccia of Banjška Planota (NW Yugoslavia)). *Rozprave, Slovenska akademija znanosti in umetnosti*, 19: 39–85.

Turnšek, D. & Mihajlović, M., 1981. Lower Cretaceous Cnidarians from Eastern Serbia. *Razprave, Slovenska akademija znanosti in umetnosti*, 23: 1–54.

Turnšek, D. & Polšak, A., 1978. Senonijske kolonijske korale iż biolititnego kompleksa v Orešju na Medvednici. (Senonian colonial corals from the biolithite complex of Oresje on Mt. Medvednica (NW Yugoslavia)). *Razprave, Slovenska akademija znanosti in umetnosti*, 21: 129–180.

Turnšek, D., Pleničar, M. & Sribar, L., 1992. Lower Cretaceous fauna from Slovenski Vrh near Kocevje (South Slovenia). *Rozprave, Slovenska akademija znanosti in umetnosti*, 33: 205–257.

Vašíček, Z., Michalik, J. & Reháková, D., 1994. Early Cretaceous stratigraphy and life in the Western Carpathians. *Beringeria*, 10: 3–169.

Veron, J. E. N., 1995. *Corals in space and time. The biogeography and evolution of the Scleractinia. Australian Institute of Marine Science*, UNSW Press, 321 pp.

Veron, J. E. N., 1996. Evolution in corals. *Paleontological Society Papers*, 1: 7–38.

Wells, J. W., 1932. Corals of the Trinity Group of the Comanchean of Central Texas. *Journal of Paleontology*, 6: 225–256.

Wells, J. W., 1937. New genera of Mesozoic and Cenozoic corals. *Journal of Paleontology*, 11: 73–77.

Wells, J. W., 1944. Cretaceous, Tertiary, and Recent corals, a sponge, and an alga from Venezuela. *Journal of Paleontology*, 18: 429–447.

Wells, J. W., 1956. Scleractinia. In: Moore, R. C. (ed.), *Treatise on Invertebrate Paleontology*, F. Geological Society/University Kansas Press, Lawrence, 328–444.

Zlatarski,V., 1967. Note sur le genre *Clausastrea* d'Orbigny (ordre Madreporaria). *Bulletin of the Geological Institute, Ser. Paleontology*, 16: 23–33, Sofia.

Zlatarski,V., 1968. *Paleobiological aspects of madreporarian corals from the Urgonian in the middle Predbalkan.* (In Bulgarian). Unpublished Thesis, *Blgarska Akademiya Naukite, Komitet po Geologija, Geologicheski Institut*, Sofija, 28 pp.

Streszczenie

ALBSKIE KORALOWCE Z JEDNOSTKI SUBPELAGOŃSKIEJ ŚRODKOWEJ GRECJI (AGROSTYLIA, REJON PARNASU)

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Opracowano, w aspekcie taksonomicznym, stratygraficznym i paleogeograficznym, kredowe koralowce Scleractinia i jeden gatunek Octocorallia, pochodzące z utworów allochtonicznych jednostki subpelagońskiej (Hackemesser, 1937; Celet, 1962; Mapy IGME, arkusz Amphissa, 1: 50000, 1960), z rejonu doliny Agrostylia, położonej ok. 25 km na północny zachód od miasteczka Arachowa, w górach Parnasu (Fig. 1).

Wiek utworów z koralowcami z Agrostylia został podany przez Celeta (1962) na podstawie rudystów jako cenomański. Hackemesser (1937) prawdopodobnie z tego stanowiska opisał pięć gatunków koralowców (2 nowe gatunki i 3 taksony oznaczone w przybliżeniu), które również zostały uznane przez niego za cenomańskie.

Opracowany obecnie bogaty zespół koralowców z Agrostylia został zebrany ze zwietrzeliny, pokrywającej zbocze doliny, w pobliżu źródła Krya Vryssi. Wschodnie zbocze tej doliny stanowi Masyw Gór Parnasu a zachodni – Masyw Jerolekas (Fig. 2, 3). Obecnie bogata szata roślinna uniemożliwia dokonania obserwacji odsłonięć wapieni z koralowcami. Ich pozycję stratygraficzną w obrębie kredowych utworów jednostki subpelagońskiej omawianego rejonu przedstawiono na figurze 4.

Opracowane koralowce zostały zebrane przez A. Marcopoulou-Diacantoni w roku 1993, zbiór ten został uzupełniony przez obie autorki w 1997 r.

Część ogólna pracy została przygotowana przez obie autorki, część paleontologiczna przez pierwszą z autorek.

Zbiór koralowców złożony jest z ok. 120 różnej wielkości kolonii i ułamków kolonii, masywnych i faceloidalnych, oraz pięciu form osobniczych. Największe kolonie osiągają ok. 80 cm średnicy (np. *Columnocoenia ksiazkiewiczi* Morycowa i *Actinastrea aequibernensis* (Hackemesser)). Niektóre szkielety występują, w różnej wielkości blokach ciemnych wapieni pelitycznych lub drobnoklastycznych.

Badania taksonomiczne przeprowadzone metodami tradycyjnymi, przy pomocy mikroskopu optycznego i skaningowego, oparto na analizie morfologii, ornamentacji i mikrostruktury szkieletów. Do szczegółowych studiów w zakresie mikrostruktury wykorzystano ok. 200 płytek cienkich z przekrojami porzecznymi i podłużnymi badanych szkieletów, wykonanych częściowo w Uniwersytecie w Atenach (ok. 70) a częściowo w Instytucie Nauk Geologicznych Uniwersytetu Jagiellońskiego. Analizy składu chemicznego szkieletów (8 analiz) wybranych reprezentatywnie koralowców przeprowadzone mikroanalizatorem rentgenowskim (EDS; aparat: Voyager 3100), wykazały że skład ich jest podobny (Fig. 5A), co mogłoby sugerować, że są one równowiekowe i ulegały podobnym procesom diagenetycznym. Analizy składu mineralnego wykonane metodą rentgenowską (Fig. 5B), wykazały, że szkielety są kalcytowe z niewielką tylko zawartością, prawdopodobnie pierwotnego aragonitu. Pomimo przekrystalizowania, mikrostruktura szkieletu jest miejscami dobrze zachowana i na jej podstawie można wyróżnić kilka mikrostrukturalnie różniących się linii rozwojowych koralowców kredowych (m.in. Fig. 8).

W faunie koralowców z rejonu Agrostylia, stwierdzono 47 taksonów reprezentujących 35 rodzajów, 15 rodzin i 8 podrzędów; spośród wymienionych taksonów opisano 3 nowe rodzaje, 9 nowych gatunków oraz 5 form oznaczono tylko rodzajowo (Fig. 9–37). Stwierdzono też występowanie jednego gatunku koralowca ośmiopromiennego. Ponadto we wstępnej notatce dotyczącej koralowców z Agrostylia (Morycowa & Marcopoulou-Diacantoni, 1997) opisano 2 nowe rodzaje i 4 nowe gatunki.

Analiza zasięgów wiekowych 25 pewnie oznaczonych gatunków (bez cf., aff. i bez nowych taksonów) wskazuje, że wiek koralowców z Agrostylia mieści się w interwale walanżyn–senon, większość jednak (15 gatunków) występuje w przedziale czasowym apt–wczesny cenoman (Fig. 6). Wiek ten można zawęzić, biorąc pod uwagę charakter zespołu koralowców i ich zasięgi wiekowe. Najwięcej spośród oznaczonych gatunków wskazuje na wiek albski. Są to gatunki, które występują do albu: 6 gatunków, 4 gatunki znane tylko z albu a 1 gatunek – z albu i cenomanu. Wskazówkę odnośnie do wieku koralowców dostarczają też pewne gatunki, np. z rodzaju *Preverastraea*. Rodzaj ten znany jest tylko z aptu i albu strefy tetydzkiej.

Opracowany zespół koralowców jest na ogół reprezentatywny dla wczesnej kredy–wczesnego cenomanu regionu tetydzkiego. Różni się jednak od większości podobnych wiekowo faun koralowców: **1** – obecnością licznych taksonów z podrzędu Rhypidogyrina (22 okazy reprezentujące 4 rodzaje i 10 gatunków, w tym jeden z nich opisany tylko rodzajowo), **2** – występowaniem licznych nowych taksonów, prawdopodobnie endemicznych dla tej części strefy tetydzkiej, oraz **3** – brakiem charakterystycznych gatunków, m.in. stylinidów, tamnasteriidów i mikrosolenidów, występujących prawie we wszystkich wczesnokredowych, płytkowodnych faunach koralowców.

W obecnej pracy wiek albski opracowanych koralowców wydaje się być potwierdzony. Za wiekiem albskim przemawia specyfika całego zespołu koralowców. Alb jest jedynym znanym dotychczas okresem kredowym, w czasie którego tak licznie rozwijały się rhypidogyriny (vide m.in. Löser, 1998). Ze względu na licznie wytępujące taksony z podrzędu Rhipidogyrina zespół nasz jest podobny do zespołów koralowców albskich Gruzji (Sikharulidze 1979) i z Abruzzów we Włoszech (Prever, 1909, wiek według Masse *et al.*, 1998).

Przyjęty albski wiek zespołu koralowców potwierdzają otwornice (Fig. 7A, B), występujące w wapieniach wypełniających szkielety koralowców lub w ich otoczeniu. Są to m.in. *Tritaxia* (*Clavulinoides*) ex gr. *gaultina* (Morozova) o morfotypie – według dr. hab. A. Gasińskiego – znanym z albu–cenomanu. Wiek ten wynika też z obecności w tym wapieniu, przewodnich dla albu, kalpionellidów (*Colomiella recta* Bonet; Fig. 7I) i dinoflagellatów wapiennych, uprzejmie oznaczonych przez dr Rehákovà (oraz Reháková, 2000; Vašíček *et al.*, 1994), m.in. *Cadosina semiradiata semiradiata* Wanner (Fig. 7E) and *Colomisphaera leporis* Rehánek (Fig. 7F).