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Note on Paleocene algae in the Dubrovnik Coast (Adriatic Carbonate Platform)

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Abstract. The presence of Paleocene in the Dubrovnik Coast (Adriatic Carbonate Platform) is documented by algal flora in the locality Pločice, Konavli. The algal assemblage includes more than 20 species. Ten taxa present in the Paleocene of the Karst (NE Italy–Slovenia) occur in Pločice: *Acroporella chiapasensis* Deloffre, Fourcade & Michaud, *Decastroporella tergestina* Barattolo, *Drobnella slovenica* Barattolo, *Dissocladella gracilis* Radoičić, *Hamulusella? liburnica* (Radoičić), *Cymopolia elongata* (Defrance) Munier–Chalmas, *Cymopolia paronai* Raineri, *Cymopolia satyavanti* (Pia), *Cymopolia* cf. *barberae* Elliott and *Microsporangiella buseri* Barattolo. The stratigraphy of the Konavli carbonate belt has been revised in this study.

Keywords: Dasycladales, Microproblematica, Paleocene, Adriatic Carbonate Platform, Dubrovnik Coast.

Апстракт. Наласком палеоценске алгалне флоре у Дубровачком приморју (Плочице, Конавли) документовано је присуство палеоцена у овом дијелу Јадранске карбонатне платформе. Алгалну скупину чини више од 20 таксона од којих је десет (укључивши и два нова рода) недавно описано из палеоцена Карста у граничној области Словеније и СИ Италије: *Acroporella chiapasensis* Deloffre, Fourcade & Michaud, *Decastroporella tergestina* Barattolo, *Drobnella slovenica* Barattolo, *Dissocladella gracilis* Radoičić, *Hamulusella? liburnica* (Radoičić), *Cymopolia elongata* (Defrance) Munier–Chalmas, *Cymopolia satyavanti* (Pia), *Cymopolia* cf. *barberae* Elliott и *Microsporangiella buseri* Barattolo. Ревидирана је стратиграфија карбонатног појаса Конавала.

Кључне ријечи: Dasycladales, Microproblematica, палеоцен, Јадранска карбонатна платформа, Дубровачко приморје.

Introduction

Paleocene sediments on the Dubrovnik Coast (Adriatic Carbonate Platform) have not been documented. The find of the Paleocene algal flora from Pločice, Konavli is worthy of the attention although details on the stratigraphic column Pločice are missing. A limestone sample with dasycladales and twenty thin sections originating from the bed overlying karstified Upper Cretaceous deposits with bauxite traces were kindly given to me by my colleague Milenko Stojković. This text – inventory of Pločice algal flora – is based on this material alone.

Geological Review

According to the Geological Map, Sheet Dubrovnik 1:100 000 (Marković, 1972; 1975), in the Konavli Cretaceous belt, west of the Zupci fault, sediments of (1) "Maastrichtian" and (2) "Danian" (= Cretaceous *Gyropleura* beds, and, in the uppermost part, beds with *Stomatopsis* and *Kosinia* which "possibly are of Paleocene age") are outcropped. The latter are unconformably overlain by Middle Eocene *Alveolina–Nummulites* limestone. East of the Zupci Fault, "Danian" is missing – Middle Eocene is lying on the "Maastrichtian" with bauxite at places. Pločice is situated west of the Zupci Fault in a succession of "Danian" *Gyropleura* beds (Fig. 1). To my knowledge, the Konavli carbonate belt consists of ?Turonian, Senonian and Paleocene (?partly) dolomites and limestone (facies of the platform interior) and Lower and Middle Eocene limestone (facies of the marginal area of the platform). Santonian–Campanian sediments bear rich foraminiferal and rudist fauna. Beds with *Rhapydionina liburnica* and rare *Neobalkhania bignoti*, with *Laffiteina mengaudi* and *Rotalia trochidiformis*, with *Gy-*

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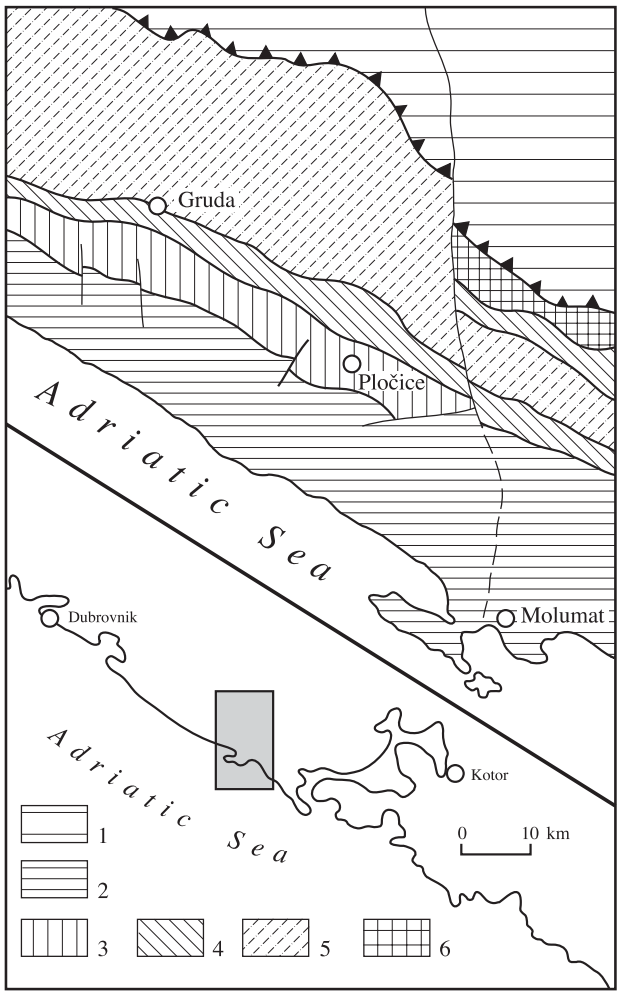

Fig. 1. Detail from the Geological Map, Sheet Dubrovnik (MARKOVIĆ, 1972), simplified. 1 = Dinaric Carbonate Platform ("Visoki krš"): Jurassic and Cretaceous; 2–4 = Adriatic Carbonate Platform ("Parautochton"): 2 = Maastrichtian, 3 = Danian *Gyropleura* beds, 4 = Middle Eocene *Nummulites–Alveolina* limestone; 5 = Eocene–Oligocene, Flysch; 6 = Cukali–Budva Basin: Upper Cretaceous (the last outcrop of this Basin towards west).

ropleura and those with atypic fossils, alternate in the Upper Maastrichtian succession.

Until recently the opinion prevailed that the marine transgression in the given part of the Adriatic Carbonate Platform (= (Dalmatian Zone. *auktorum*) began only in the Lutetian: BIGNOT & CADET, 1972; CADET, 1978).

Upper Maastrichtian deposits with *Rhapydionina liburnica* (= Danian *sensu* MARKOVIĆ, 1972) are also distributed east of the Zupci Fault. On the Dubrovnik Coast and in the Boka Kotorska, these sediments are dolomitized and epigenetically much altered, at places they are more or less karstified.

The information about the Paleocene suggests a need for a more detailed study of the transitional ACP/Cukali Budva Basin area. Dating of stratigraphic gaps would be very important, because they are multiple and of various duration in individual platform blocks.

Pločice algal flora

The sampled Paleocene bed (subtidal bioclastic packstone–wackestone, partly removed) contains rich algal flora which were a transported component and sorted in part of the bed (Pl. 6, Fig. 5). Numerous altered specimens have lost primary features, in such a way that even their generic characters could not be recognized. The fauna consists of rare gastropods, corals and numerous foraminifera (prevailing frequently discorbids, *Bangiana*, *Gyroidinella*, *Rotalia*, *Miliolidae*). Disaggregated and resedimented *Paronipora* elements are dispersed or concentrated in laminae. Vugs with speleothem fabric in this Paleocene limestone indicate subaerial exposure as well as karstification.

BARATTOLO (1998) presented rich and well preserved assemblages of Dasycladales and microproblermatica from Maastrichtian and Paleocene in Karst, Slovenia–Italy boundary area. Ten taxa of this algal flora, including two new genera, were found in the Pločice Paleocene. The abundant transported algae in the Pločice limestone originate from shallow–water littoral areas which were inhabited by diverse algal populations.

The algal assemblage from Pločice includes the following species:

Acroporella chiapasensis DELOFFRE, FOURCADE & MICHAUD, 1985
Pl. 1, Figs. 1-11, 13

This species is described in rich but poorly preserved material from the Maastrichtian of the Chiapas region in Mexico: small–sized cylindrical thallus (D 0.375–1.05 mm) with "un axe principal particulierment large" (0.225–0.6 mm), inclined primary, bearing tufts of 5–8 secondary laterals and a d/D of 60%. In the illustrated sections, the secondary laterals are not clearly visible.

In the Karst area, the species is found in beds "from uppermost Maastrichtian to lower Danian (Sopada section) or only in Danian beds (Cole de Medea) (BARATTOLO, 1998).

The specimens of *Acroporella chiapassenis* in Pločice are much better preserved than those in type localities. The thin dark microcrystalline layer around the axis and those around some pores is calcified membrane of primary organic origin. Short secondary laterals are rarely observed (Pl. 1, Fig. 1). The thallus is smaller in size (0.336–0.640 mm) and, compared with type material, has a narrower axis (0.160–0.320 mm) and, consequently, a different d/D value (34–45%).

It seems that specimens of smaller dimension prevail in the population of *Acroporella chiapasensis* from the Karst area (BARATTOLO, 1998; pl. 1, figs. 1, 2, 4), but that rare specimens have a larger axis diameter similar to the Mexican material (Pl. 1, Fig. 3)

Most probably, individuals with a small sized thallus and a narrower axis prevail in populations of this alga in Dinaridic domains.

It should be mentioned at this point that *Acroporella chiapasensis* is also present in the Maastrichtian of the same belt, east of the Zupci Fault. The only specimen, shown in Pl. 1, Fig. 13, was found in a bed with *Rhapydionina liburnica*.

Clypeina sp. aff. ***Clypeina occidentalis*** (JOHNSON & KASKA, 1965)
Pl. 6, Fig. 2

Rare, poorly preserved, narrow cylindrical tubes with whorls of bowl–like inclined primary laterals are *Clypeina*, which are similar to *Clypeina occidentalis* in terms of the form of the laterals.

Genus *Cymopolia* LAMOUROUX is represented by rare specimens of different species:

Cymopolia paronai RAINERI, 1930
Pl. 2, Fig. 12

Only two fragments of this species (which are very frequent in the Karst area) are recognized in the examined thin sections.

Cymopolia satyavanti (PIA *in* RAMA RAO & PIA, 1936)
Pl. 1, Fig. 12

The oblique section of a cylindrical tube ascribed to this taxon represents a sterile article (see sterile articles illustrated by PIA *in* RAMA RAO and PIA, 1936; pl. 1). Whorls of sterile articles consist of inclined laterals: a short primary bearing two funnel–like secondaries gradually enlarged, swollen at the distal end. The latter are arranged in pairs, one above the other in a vertical plane, which is clearly visible in the illustrated section (arrows).

Cymopolia ellongata (DEFRANCE, 1825) MUNIER–CHALMAS, 1877
Pl. 2, Fig. 5

This taxon is represented mostly by rare articles.

Cymopolia sp. 1
Pl. 2, Fig. 7

The article with oblique primary laterals and large sporangia is *Cymopolia*, presented by BARATTOLO as *Cymopolia* cf. *barberae* ELLIOTT, 1968.

Cymopolia sp. 2
Pl. 2, Figs. 1, 2

Elongated article characterized by relatively long oblique primary laterals dividing into 5 (4–6) sub–horizontal secondary ones. Specimens in Pl. 2, Figs. 2, 3 are probably sterile articles of the same species.

Some undetermined cymopoliae are illustrated in the same plate: Fig. 6 (narrow cylindrical sterile article), and 8–10.

Decastroporella tergestina BARATTOLO, 1998
Pl. 3, Figs. 8–13

Genus *Decastroporella* – type species *Decastroporella tergestina* is introduced on the rich, well preserved material from the Karst area. The main characteristics of the species are a peculiar thallus structure (lower cylindrical portion and well differentiated head), the presence of sterile and fertile laterals and, possibly, double location of the reproductive organs.

Decastroporella tergestina is characterized by an articulated cylindrical portion. Relatively more or less long articles bear numerous sterile laterals (hair type) and, at the top, a whorl of phloiophoreous fertile primary laterals. The head of the thallus is also covered by numerous sterile laterals. Due to its dismembered thallus, the head occurs separately from the cylindrical portion.

In the Pločice limestone, the thallus of this species is dismembered; separate articles are dispersed in the rock, fragments with two or three articles rarely occur. The recrystallized wall of the articles is often thicker without preserved pores corresponding to sterile laterals (Pl. 3, Figs. 2, 3, 9). One large circular section with a thin microcrystalline wall is the only specimen of a thallus head. (Pl. 6, Fig. 6).

Dissocladella gracilis RADOIČIĆ, 1991
Pl. 4, Figs. 7–13

This small Dissocladella decribed from Paleocene of Mt. Majevica, Bosnia, was recognized by Barattolo in Danian beds of the Cole de Medea section. Specimens from Pločice are somewhat larger than those in the type locality (Table 1).

Table 1. Measurements.

	Majevica	Pločice
D	0.160–0.290 (0.368)	0.208–0.352 (0.480)
d	0.080–0.160 (0.208)	0.144–0.160 (0.208)
h	0.075–0.090	0.090–0.112 (0.120)
w	8–10 (15)	8–10
w'	4	4 (5)

Calcareous tubes of *Dissocladela gracilis* in the Pločice limestone are differently preserved, in some of them pores are rare or unpreserved, especially the pores

of secondary laterals. Some specimens have more or less enlarged pores.

Hamulusella? liburnica (RADOIČIĆ *in* BUSER & RADOIČIĆ, 1987)
Pl. 5, Figs. 6, 7

Only some sections are ascribed to this species, which is widely distributed and well preserved in Paleocene of the Karst area.

Microsporangiella buseri BARATTOLO, 1998
Pl. 5, Fig. 8

This taxon is represented by a few specimens only.

Dasycladalean DS2 (gen. nov.?, sp. nov.)
Pl. 5, Figs. 1–5

In the Paleocene of Materija, Slovenia, dasycladalean DS2 occurs, as in Pločice, associated with *Decastroporella tergestina* and *Drobnella slovenica* (BUSER & RADOIČIĆ, 1987, pl.3, figs. 3, 4). Some sections of this species appear to have a thallus of a simple structure, as is the case with some *Clypeina*. In fact its structure is more complex, the fertile ampullae location is not quite clear. At the moment, the available material does not provide sufficient data for the introduction of a new genus and species .

Terquemella spp.
Pl. 1, Fig. 15; Pl. 2, Fig. 3

Terquemelae are a minor component in the Pločice algal assemblage.

Some of the undetermined dasycladales are also illustrated: DP1 (Pl. 1, Fig. 16), DP2 (Pl. 2, Fig. 11), DP3 (Pl. 3, Fig. 14), DP4 (Pl. 5, Fig. 9), DP5 (Pl. 6, Fig. 1), DP6 (Pl. 6, Fig. 3).

Microproblematica, Alga

Drobnella slovenica BARATTOLO, 1998
Pl. 4, Figs. 1–6

Although *Drobnella slovenica* is described on the rich relatively well preserved material (numerous large thallus fragments), their systematic position is at the moment uncertain: Chlorophyta or Charophyta? The species is characterized by a peculiar thallus structure and, especially, by an exceptional calcareous skeleton, which "does not seem to have been recorded before in more or less similar fossil algae" (BARATTOLO, 1998: 89).

In the Pločice Paleocene, as in Materia, Slovenia, *Drobnella slovenica* is presented only by small skeletal fragments and different sections of elongated pores – "main pores". The unusual tangential–oblique section of the main pore, illustrated in Pl. 4, Fig. 6, has a very long pointed distal end, much longer than observed in the Karst material.

Age of Pločice limestone

Decastroporella tergestina, *Drobnella slovenica*, and *Acroporella chiapasensis* are the dominant species in the Pločice assemblage. In the Karst area, *Decastroporella tergestina* and *Drobnella slovenica* appear "very close to the K/T boundary" and were distributed in SBZ1. *Acroporella chiapasensis* appears in Maastrichtian; in the Danian SBZ1, it is associated with *Decastroporella tergestina* and *Drobnella slovenica*. These taxa appear before the appearance of the *Cymopolia* assemblage in the lowest part of SBZ1 (BARATTOLO, 1998: 93). Consequently, the algal flora in the Pločice limestone can be asscribed to the Late Danian. Valuable data on the development and the distribution of Paleocene in this domain of the Adriatic Carbonate Platform is to be expected through further and more detailed studies of the Konavli Paleocene.

Acknowledgement

I am thankful to my colleague MILENKO STOJKOVIĆ who gave me the rock-sample from Pločice and thus contributed to the knowledge of the Paleocene in the Konavli carbonate belt.

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Резиме

Биљешка о палеоценским алгама Дубровачког приморја (Јадранска карбонатна платформа)

У узорку кречњака из Плочица у Конавлима (Дубровачко приморје), који ми је љубазно уступио колега Миленко Стојановић, нађена је богата палеоценска алгална флора. Овим налазом документовано је присуство палеоцена у карбонатном појасу Конавала који припада Јадранској карбонатној платформи (= параутохтон аутора). Алгалну скупину чини више од двадесет врста дазикладалеса и алгални род и врста проблематичне припадности – *Drobnella slovenica* BARATTOLO.

Према Основној геолошкој карти листа Дубровник 1:100 000 (МАРКОВИЋ, 1972) карбонатни појас Конавала, западно од Зубачког расједа, изграђују седименти "мастрихта" и "данијена" који се сматра горњокредним катом (= слојеви са гироплеурама и, у највишем дијелу, са стоматопсисима и козинијама. За ове потоње се каже да могуће припадају палеоцену). Источно од Зубачког расједа слојеви данијена недостају, а алвеолиунски и нумулитски кречњаци средњег еоцена леже преко "мастрихта" са појавама боксита (сл. 1).

Карбонатни појас Конавала, на основу садашњег познавања, чине ?туронски, сенонски и палеоценски кречњаци и доломити (фације платформне унутрашњости) и кречњаци доњег и средњег еоцена (фације маргиналног платформног ареала). Слојеви са *Rhapydionina liburnica* и *Neobalkhania bignoti*, са *Laffiteina mengaudi* и *Rotalia trochidiformis*, са гироплеурама и они са атипичним фосилима наизмјенично се јављају у горњем мастрихту. Горњомастрихтски седименти са *Rhypidionina liburnica* (= "данијен" у смислу МАРКОВИЋ, 1972) такође су распрострањени источно од Зубачког расједа. У Дубровачком приморју, као и у Боки Которској, ови седименти су доломитизирани и веома епигенетски измијењени, мјестимично су знатно карстификовани.

Анализирани узорак субплиматски биокластични пекстон-векстон, дјелом синседиментно поремећен. Алгална флора је транспортована; у дијелу слоја биогена компонента је сортирана (таб. 6, сл. 5). Фауну чине ријетки гастроподи, корали и веома учестали фораминифери (дискорбиди, *Bangiana*, *Gyroidinella*, *Rotalia*, *Miliolidae*). Елементи–кристали разорених *Paronipora* веома су бројни, јављају се расути у седименту или концентрисани у ламине (таб. 6, сл. 5).

Карсне шупљине у узорку овог палеоценског кречњака указују на постојање стратиграфске празнине и у палеоцену (стратиграфске празнине – краћа или дужа изроњавања – у интервалу мастрихт–палеоген су вишекратна и различитог трајања на појединим блоковима платформе).

Алгална флора Плочица у великој мјери је слична палеоценској флори Карста (гранично подручје Словеније и СИ Италије) коју је у веома обимној студији приказао BARATTOLO (1998).

Decastroporella tergestina, *Drobnella slovenica* и *Acroporella chiapasensis* доминантне су врсте у кречњаку Плочица.

BARATTOLO помиње да се ови таксони у области Карста јављају "very close to K/T boundary" и да су распрострањени у интервалу СБЗ1, дакле данске су старости. Полазећи од овог податка, анализирани кречњак Плочица такође је данске старости. Имајући у виду знатно учешће рода *Cymopolia*, евидентну стратиграфску празнину и мјестимично знатно карстификовану кредну подлогу, палеоценски кречњак Плочица одговарао би вишем данијену.

Карсне шупљине у анализираном узорку указују на постојање стратиграфске празнине и у палеоцену (стратиграфске празнине – краћа или дужа изроњавања у интервалу мастрихт–палеоген су вишекратна и различитог трајања на појединим блоковима платформе.

Налазак палеоцена у Конавлима треба да буде потицај детаљнијем биостратиграфском и седиментолошком проучавању сукцесије мастрихт–средњи еоцен у Дубровачком и Црногорском приморју.

PLATE 1

Figs. 1–11. *Acroporella chiapasensis* DELOFFRE, FOURCADE & MICHAUD. Note secondary laterals in Fig. 1 (arrows),
1–8, 11. Different oblique sections; × 50. Thin sections RR2958, 2959, 2962, 2957, 2958, 2961, 2947, 2961, 2948.
9. Transversal oblique section; × 50. Thin section RR2963.
10. Longitudinal section; × 50. Thin sections RR2948.

Fig. 12. *Cymopolia satyavanti* (PIA *in* RAMA RAO & PIA). Oblique section. Note two secondary laterals set vertically one above other (arrows); × 50. Thin section RR2961,

Fig. 13. *Acroporella chiapasensis* DELOFFRE, FOURCADE & MICHUD. From the bed with *Rhapydionina liburnica*; slightly oblique longitudinal section, Maastrichtian, Igalo, Boka Kotorska (east of the Zupci fault); × 50. Thin section RR2540.

Fig. 14. Unknown dasycladalean alga from the bed with *Acroporella chiapasensis* and *Rhapydionina liburnica*; × 50; Thin section RR2541.

Fig. 15. *Terquemella* sp.; × 50. Thin section RR2945.

Fig. 16. Dasycladales DP1. Fragment of the whorl with large bowl–like laterals; × 50. Thin section RR259.

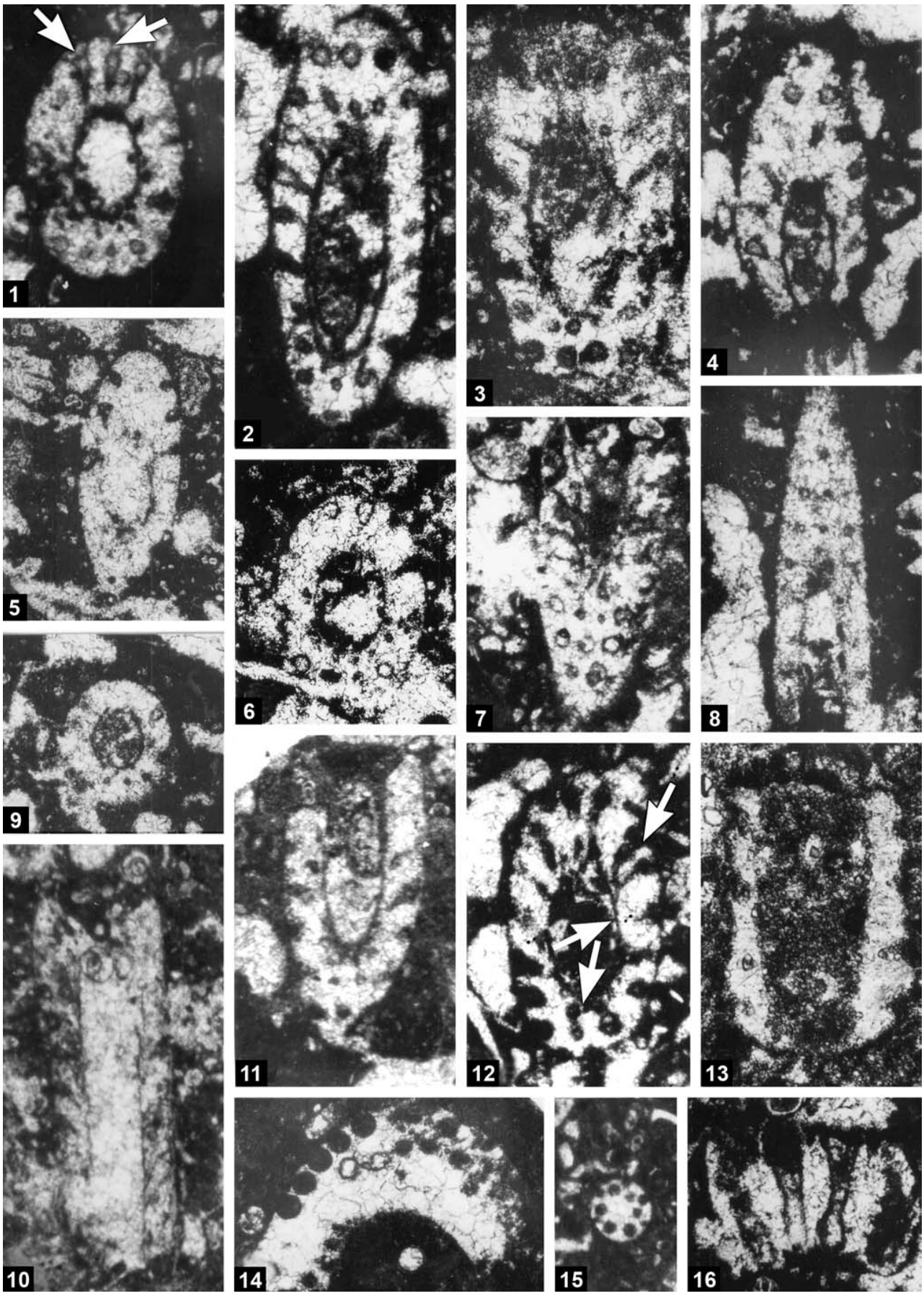
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PLATE 2

Figs. 1, 2. *Cymopolia* sp. 1.
1. Longitudinal oblique section; × 35. Thin section RR2950.
2. Oblique section; × 50. Thin section RR2950.

Fig. 3. *Terquemella* sp. × 60. Thin section RR2953.

Fig. 4. *Cymopolia* sp. (aff. *C. ellongata*). Specimen with short primary, longer secondary laterals and small fertile ampullae, oblique section; × 60. Thin section RR2964.

Fig. 5. *Cymopolia ellongata* (DEFRANCE) MUNIER–CHALMAS. Probably sterile article, oblique section; × 50. Thin section RR2960.

Fig. 6. *Cymopolia* sp. 2. Sterile article, longitudinal section; × 50. Thin section RR2955.

Fig. 7. *Cymopolia* sp. nov.?. Oblique section. The same species is presented by BARATTOLO as "*Cymopolia* cf. *barberae* ELLIOTT"; × 35. Thin section RR2961.

Figs. 8–10. *Cymopolia* spp.
8, 9. Longitudinal oblique section; × 50. Thin sections RR2950, 2959.
10. Transversal section; × 50. Thin section RR2964.

Fig. 11. Dasycladales DP2. × 60. Thin section RR2944.

Fig. 12. *Cymopolia paronai* RAINERI. Transversal section, fragment; × 60. Thin section RR2954.

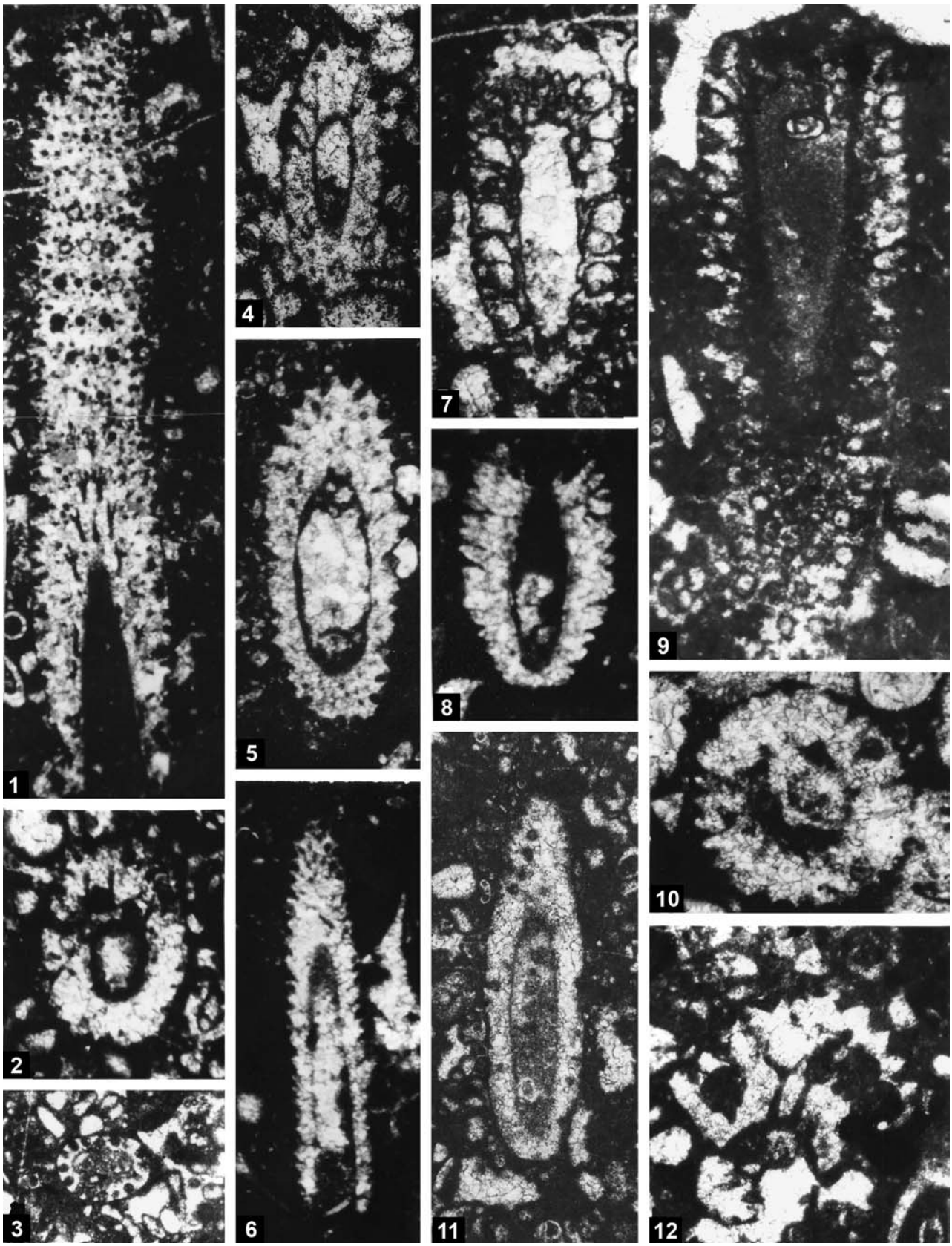
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PLATE 3

Figs. 1–13. *Decastroporella tergestina* BARATTOLO.
1–4, 13. Different longitudinal sections; × 50. 1: two complete articles; lower part of the article shows pores corresponding to sterile "subtile" laterals, upper part bears a whorl of "massive" (fertile) laterals. Thin sections RR2946, 2944, 2953, 2951; RR2955.
5–8. Transversal sections; × 50. Thin sections RR2963, 2955, 2955, 2946.
9–12. Oblique sections; × 50. Thin sections RR2944, 2952, 2946, 2952.

Fig. 14. Dasycladales DP3. Longitudinal–oblique section, fragment; × 60. Thin section RR2950.

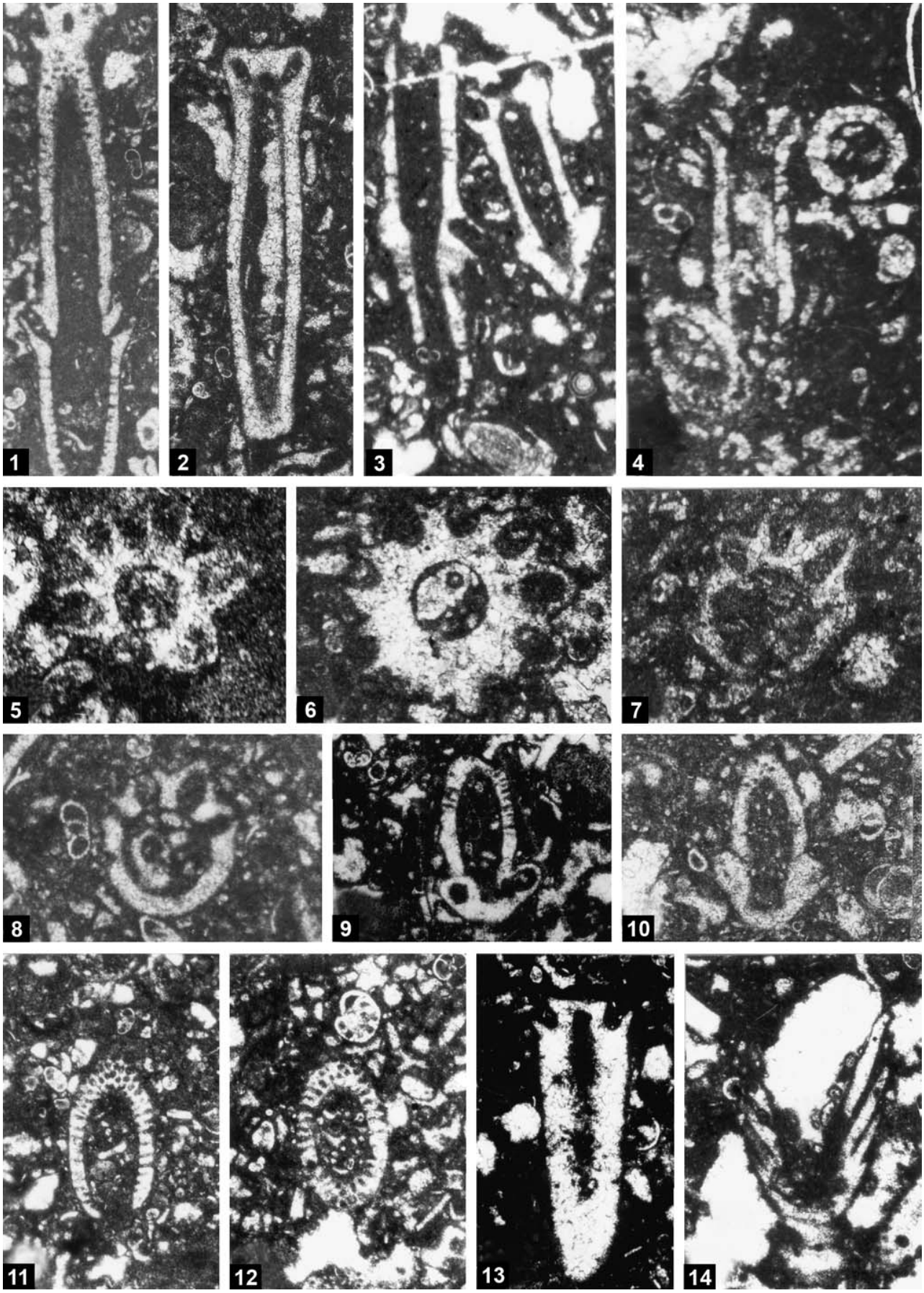
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PLATE 4

Figs. 1–6. *Drobnella slovenica* BARATTOLO.
1–5. Different sections of laterals ("main pores"); × 50. Thin sections RR2965, 2964, 2955/1, 2950, 2955/1
6. Tangential-oblique section of the lateral with a very long pierced distal end; × 50. Thin section RR2955/1.

Figs. 7–13. *Dissocladella gracilis* RADOIČIĆ.
7. Longitudinal section; × 50. Thin section RR2944.
8, 13. Transversal sections; × 50. Thin sections RR2955, 2950; arrows: secondа laterals.
9, 11, 12. Transversal–oblique sections; × 50. Thin sections RR2950, 2958, 2950.

Fig. 14. *Dissocladella*?. Pores secondary enlarged, calcareous sheet micritized; × 50. Thin section RR2944.

Fig. 15. *Dissocledella* cf. *D. gracilis*. Longitudinal section; × 50. Thin section 2944.

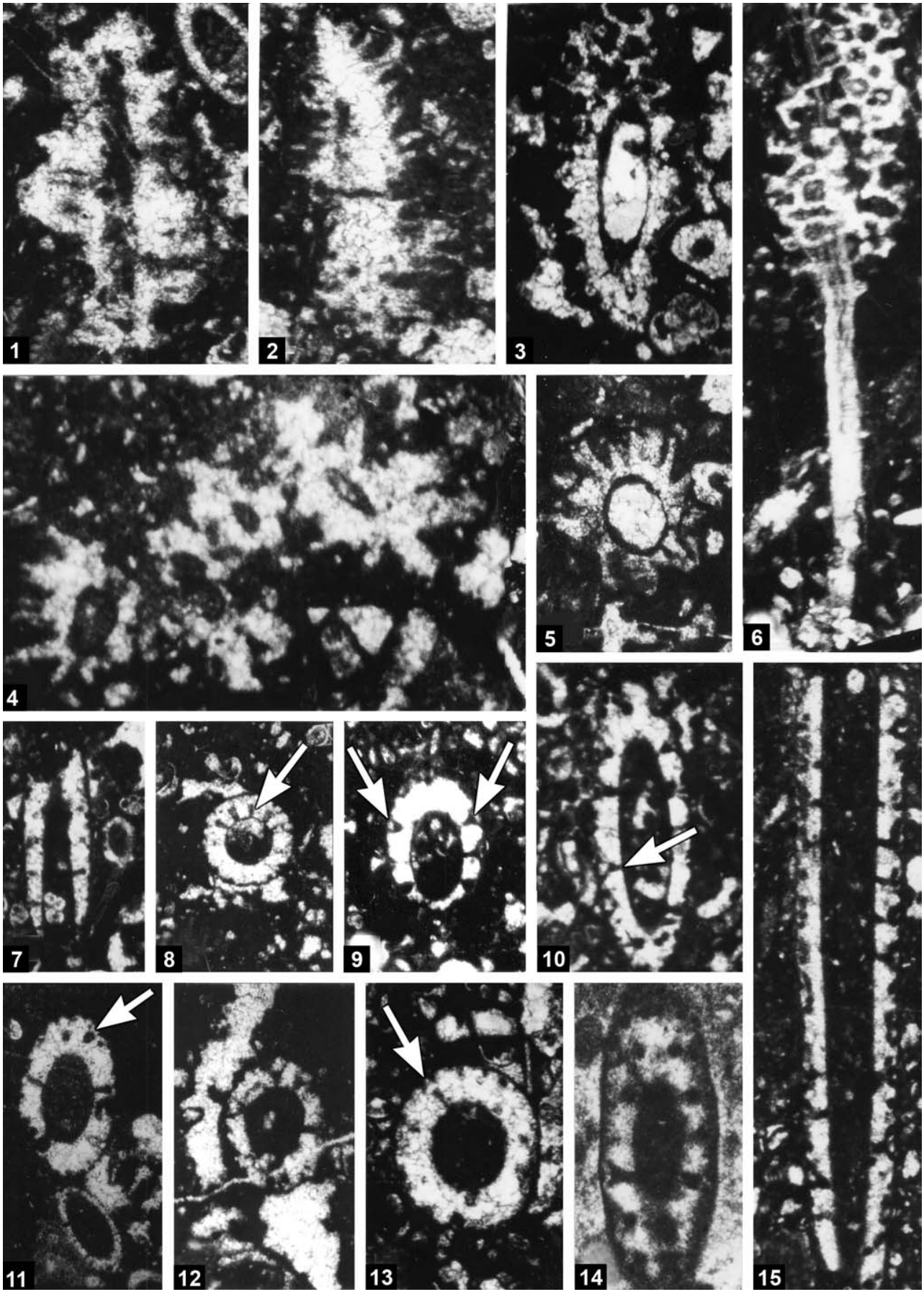
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PLATE 5

Figs. 1–5. Dasycladales DS2 (nov. gen.?, nov sp.)
1–4. Different oblique sections; × 50. Thin sections RR2964, 2964, 2947, 2956.
5. Transversal–oblique section; × 50. Thin section RR2959.

Figs. 6, 7. *Hamulusella? liburnica* (RADOIČIĆ).
6. Longitudinal–oblique section; × 50. Thin section RR2965.
7. Transversal–oblique section; × 50. Thin sections 2956,

Fig. 8. *Microsporangiella buseri* BARATTOLO. × 50. Thin section RR2944,

Fig. 9. Dasycladales DP4. × 60. Thin section RR2953.

Fig. 10. Discorbidae. × 80. Thin section RR2954.

Fig. 11. *Rotalia* sp. × 50. Thin section 2946.

Fig. 12–14. *Gyroidinella* spp. × 50. Thin sections RR2953, 2954, 2944,

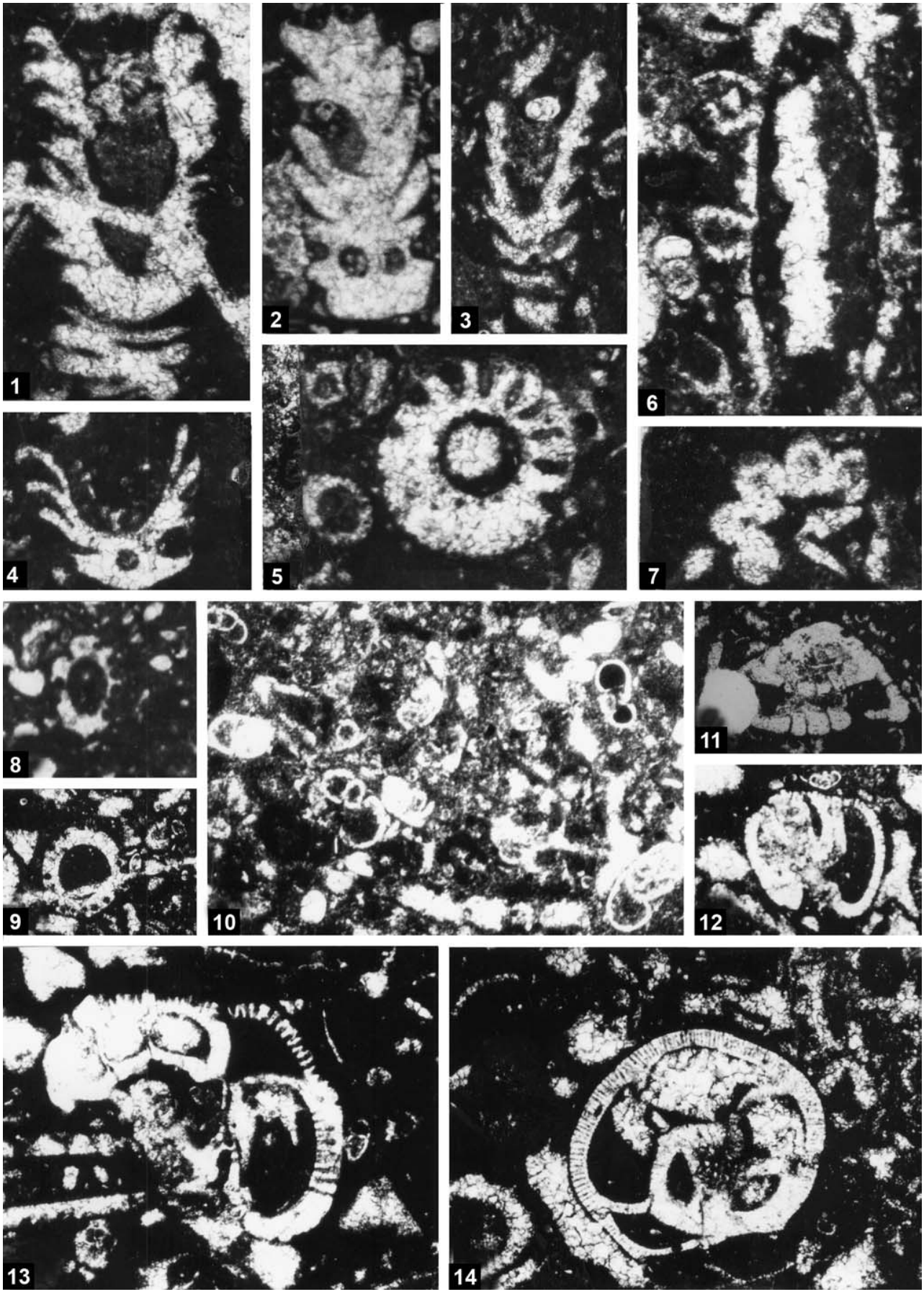
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PLATE 6

Fig. 1. Dasycladales DP5. Unknown dasycladales with very large axis and numerous laterals; × 35. Thin section RR2961.

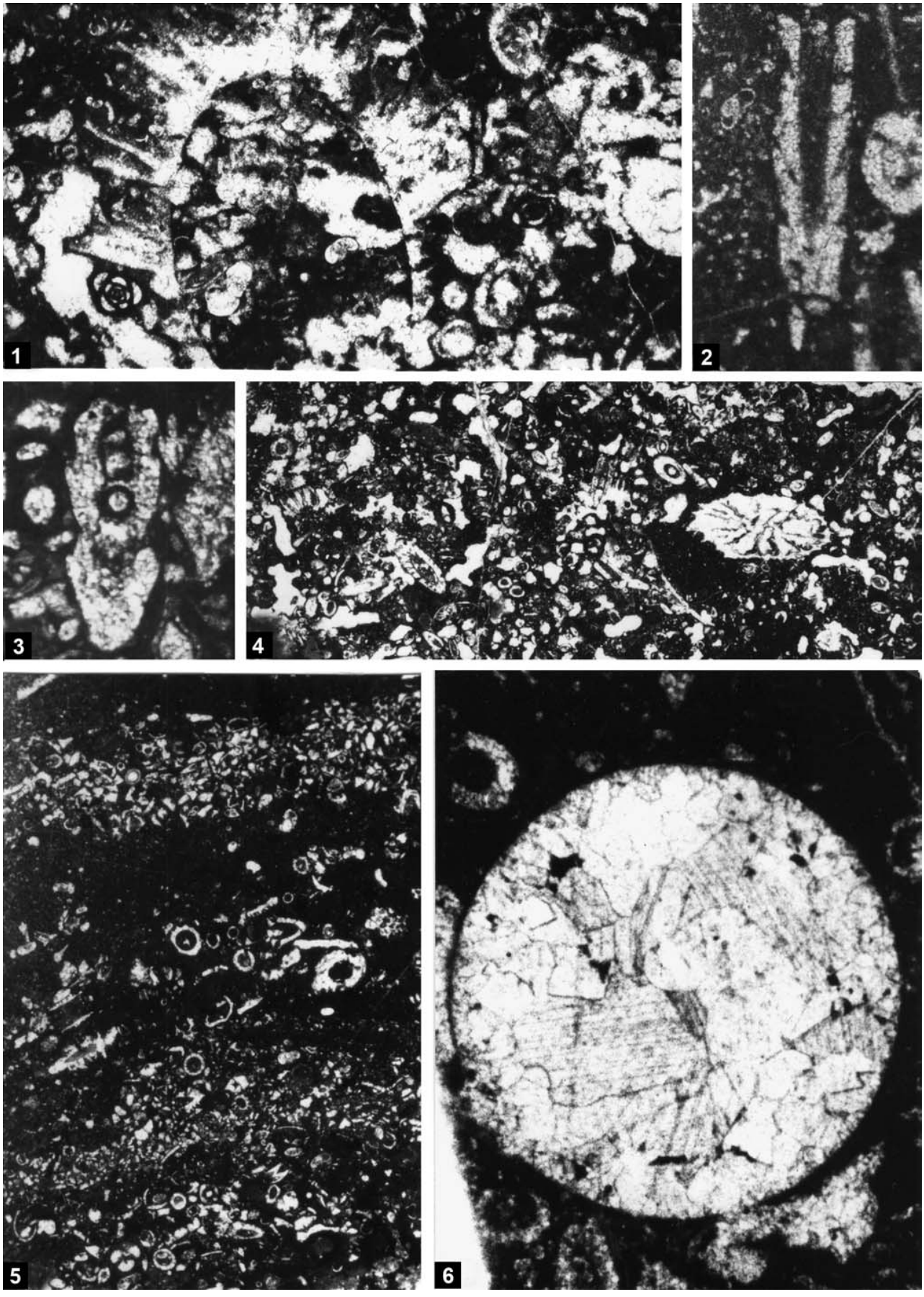
Fig. 2. *Clypeina* sp. aff. *Cl. occidentalis* (JOHNSON & KASKA). × 60. Thin section RR2951.

Fig. 3. Dasycladales DP6. × 40. Thin section RR2951/1.

Fig. 4. Pločice limestone, microfacies. On the left: *Acroporella chapasssis* (= Pl. 1, Fig. 2) and DP1 (= Pl. 1, Fig. 16); × 10. Thin section RR2959.

Fig. 5. Pločice limestone, microfacies. Note laminae: prevailing with *Paronipora* crystals; on the left, in the middle, *Drobnella slovenica*; × 15. Thin section RR2954.

Fig. 6. *Decastroporella tergestina* BARATTOLO. The head of a thallus; × 45. Thin section RR2956.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