

Geol. vjesnik	27	133—141	5 pls.	Zagreb, 1974
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561.263:551.761(161.16.44)

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DIPLOPORA CLAVAEFORMIS PIA (CHLOROPHYTA,
DASYCLADACEAE) FROM THE LOWER LADINIAN OF MT. VELEBIT

Diplopora clavaeformis Pia was originally described over 50 years ago from Anisian limestones, of Han Bulog, Bosnia; afterwards, it was not found again until recently in a new locality in Lower Ladinian limestones near Gračac, in Mt. Velebit (Croatia). On the basis of this new material and comparatively numerous specimens, the description of the species is completed with newly discovered characteristics, which were omitted in the original description.

During field work carried out in 1962 in the wider area of Gračac, on the northeastern slopes of Mt. Velebit, several samples of Ladinian limestone with sections of large, club-shaped and clearly annulated calcareous algae were collected. This material yielded only two determinable sections, which pointed to *Diplopora clavaeformis* Pia. However, certain features seemed to disagree with the original description by Pia (1920, p. 68—71). In spite of further efforts in searching for new suitable sections, no more determinable sections were obtained from this material. Therefore the study of this alga was postponed, in the hope that possible new finds would make it more successful. It was noticed that specimens of this alga were to be found on lower bedding planes, which considerably restricted the possibility of new finds. It was hoped, however, that particular lithologic properties of rocks (well-bedded, dark grey, partly pyritized micritic limestones) would help in finding new localities during further investigations, but this type of limestone was found nowhere else, although in the years that followed a Ladinian zone stretching more than 80 km in length in the northwest of Gračac was searched all over. Therefore, the present author, accompanied by Mr. I.

Velić, returned to the already discovered locality in 1973 and on that occasion a sufficient number of well preserved specimens was collected.

What we actually know about this species is based merely on the original description by Pia (1920); this description, however, is based on a single, incompletely preserved specimen from the Trinodosus-limestone of the locality of Bare (Zli Stup) near Han Bulog, Bosnia. That certain morphologic-structural details remained inadequately known, and others, although correctly interpreted, stated as doubtful, is easy to understand when we remember that the only available specimen, in addition to being incomplete, happened to be recrystallized. This fact, as well as the absence of later proofs for more than 50 years (from 1920 until now), probably led to the suspicion that the species was self-standing as hinted at, for example, by Hurka & Schmid (1971, p. 512).

Chlorophyta

Family Dasycladaceae Kützing, orth. mut. Stizenberger, 1860

Tribe Diploporeae Pia, 1927

Genus *Diplopora* Schafhäütl, 1863

Diplopora clavaeformis Pia

Pl. I—IV; pl. V, figs. 1—4

1920. *Diplopora clavaeformis* n. sp. — Pia, p. 68—71, text-fig. 16; Pl. IV, fig. 17.
1935. *Diplopora clavaeformis* Pia. — Pia, p. 246, text-fig. 55.

Description: Rather numerous well preserved specimens, which appear as washed skeletons on lower bedding planes, and numerous variously oriented sections display a club-shaped, distinctly annulated, calcareous skeleton. Generally, the shape is identical to that figured by Pia (1920, p. 70, text-fig. 16; 1936, p. 245, text-fig. 55), but there are differences in the structure of the calcareous skeleton. This refers to calcareous segments, which are oriented slightly upward and situated obliquely (Pl. II, fig. 1). These segments show thickening and distal widening in the upper parts of the plant, in contrast to those in the basal part which are of the same thickness all along their length (Pl. II, figs. 1—3; Pl. IV, fig. 3). The distance between two consecutive segments is markedly smaller in the basal part of the plant than in the upper part. Further differences with regard to Pia's reconstruction can be observed in the uppermost part of the plant, its top having the shape of a calcareous calotte corresponding to one segment (Pl. I, fig. 3; Pl. II, figs. 1, 3). The segments are linked together to form a calcareous skeleton by very thin calcareous walls which separate the main stem from

the outer recesses (annulation). The thickness of this wall is twice as much in the lower part of the plant as it is in the top part (Pl. II, fig. 1; Pl. IV, fig. 3). The main stem is very broad, occupying more than $2/3$ of the total diameter in the upper part of the plant.

The branches, characteristic of the genus *Diplopora*, are arranged in whorls (verticills), each segment bearing one whorl. The whorls consist of a row of tufts formed of 4, exceptionally 5, branches, which are linked together by a common base (Pl. III, figs. 1—4). Therefore the tufts can be seen in sections cut through the base of the branches or immediately near the base, i. e. before the branches start to diverge (Pl. III, figs. 1—4). In spite of certain indications (Pl. III, figs. 2—3), it remains doubtful whether the thickened and distally widened segments in the upper part of the plant may have two whorls of branches, in which, then, the tufts would alternate from one whorl to another. The existence of two whorls in one segment could be reliably established only in two segments and hence it is minimal. Considering the structure of the branches, Pia (1920, p. 70) left the question unsolved, writing: »Fragen könnte man sich sogar, ob die Poren von *Diplopora clavaeformis* nicht sekundären Wirtelästen entsprechen und die primären Aste ganz unverkalt waren. Die Stammzelle hätte dann nicht eine so enorme Dicke gehabt.« In the available material, the relationship of the branches with the main stem can be observed, the branches being separated from the main stem by a very thin, not always preserved, calcite wall, which here and there projects slightly into the main stem (Pl. II, fig. 1; Pl. IV, fig. 3). Hence it can be concluded that the communication between the main stem and the branches takes place through a small pore. The bases of the tufts of branches in a whorl are densely compressed together and separated from each other by a very thin calcareous partition. The number of tufts in a whorl in the upper part of the plant is supposed to be about 40—50. The divergence of the branches from their base removes the suspicion of the possible presence of primary and secondary branches, although this question appears to be justified in some other species of this genus.

The branches, having left their common base, diverge from each other, and sometimes certain branches are slightly curved. With regard to Pia's description, there is a more pronounced difference in the form of the form of the branches after they have left their mutual base. According to Pia, the branches taper out outwardly and hence belong to the trichophorous type. In the available material, however, it is evident that the form of the branches may vary depending on where they are situated, i. e. which part of the calcareous skeleton is cut by the section. In the lower part of the skeleton, which is in general characterized by smaller dimensions and particularly by narrower calcareous segments, the branches taper slightly going outwards, or, being relatively thin, are of approximately the same thickness all along their length (Pl.

III, fig. 5; Pl. IV, fig. 1), which points to the trichophorous type. However, in the swollen and distally widened segments of the upper part of the plant, the branches have a different shape. They gradually thicken going outwards and even show a tendency to form the vesiculiferous type, though they fail to reach it completely (Pl. III, figs. 2—3; Pl. V, figs. 1, 2, 4). It is possible that a more pronounced vesiculiferous type of the branches may have been found in the calcareous calotte at the top of the plant.

Dimensions in mm:

Maximum observed length	53
Number of segments in maximum observed length	34
Outer diameter in the upper part of the thallus	8.87—12.58
Inner diameter in the upper part of the thallus	6.29—9.62
Outer diameter in the lower part of the thallus	5.55—8.33
Inner diameter in the lower part of the thallus	2.78—4.81
Distance between two whorls in the upper part of the thallus	2.22—2.78
Distance between two whorls in the lower part of the thallus	1.48—1.78
Number of tufts in a whorl	40—50
Number of branches in a tuft	4—5?
Length of branches	1.11—1.55
Thickness of branches at their base in the upper part of the thallus	0.10—0.19
Thickness of the distal part of branches in the upper part of the thallus	0.25—0.48
Thickness of branches at their base in the lower part of the thallus	0.09
Thickness of the distal part of branches in the lower part of the thallus	0.06
Thickness of the calcareous wall between consecutive segments in the upper part of the thallus	0.05—0.10
Thickness of the calcareous wall between consecutive segments in the lower part of the thallus	0.18—0.33
Width of segments at the distal end in the upper part of the thallus	1.67—2.33
Width of segments at the distal end in the lower part of the thallus	0.63—0.93

Similarities and differences: In the structure of *Diplopora clavaeformis* we can find several features characteristic of the genus *Diplopora*. By its dimensions and the thin calcareous wall at the bottom of the annulated spaces it differs distinctly from the similar species of the same genus. Pia (1920) pointed out already that the differences in dimensions are too large for this species to be conceived as *Diplopora annulatissima*, from which it also differs by the club-shaped top

of the thallus. In addition to these differences, it is now possible to see that *D. clavaeformis* differs from *D. annulatissima* (with which it is most similar in certain section cut through the lower part of the thallus) in the shape of branches. A feature that both species have in common is one whorl in each segment, although *D. clavaeformis* is supposed to have two whorls in the top segments or even in the segment next to the top one.

If *D. clavaeformis* is compared with *D. praecursor* Pia, according to the description of the latter by Hurka & Schmid (1971), the differences are obvious and no confusion is possible. The differences are partly visible from the dimensions and the shape of the calcareous skeleton: in *D. clavaeformis* it widens gradually in its upper part, and in *D. praecursor* it swells more abruptly, acquiring a form of a goatskin bag. Segmentation is much more distinct in *D. clavaeformis*, and the essential difference between the two species consists in the shape of the branches and in the number of branches in one tuft. In *D. clavaeformis* there are 4, possibly even 5, branches in a tuft, whereas in *D. praecursor* there are 2, exceptionally 3, branches in a tuft (Hurka & Schmid, 1971). There are also some minor similarities with other species, but the existence of sharp differences rules out the necessity of a further analysis.

In spite of the above mentioned differences with regard to Pia's (1920) original description, the described material belongs beyond all doubt to *D. clavaeformis*, and thus all new observations should be considered a supplement to the original description.

Stratigraphic position. The species described here has been found on the northeastern slopes of Mt. Velebit, west of Rastovača (south of Gračačko polje), in dark-grey micritic limestone of the Lower Ladinian. The Lower Ladinian age of these deposits has been inferred from the superposition and the presence of rather numerous sections of *Diplopora annulata* Schafhäutl with both subspecies.

Rare finds of *D. clavaeformis*, of which this is only the second finding-place known so far, may be explained by its tender structure that requires extremely favourable sedimentary conditions to be preserved. Such environmental conditions obtain only locally, in a quiet (protected), partly reductive, marine environment resulting in the deposition of biomicrites with very fine biogene detritus and with some finely dispersed pyrite, which is subsequently limonitized.

Received 27 March 1974.

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B. SOKAČ

O VRSTI DIPLOPORA CLAVAEFORMIS PIA (CHLOROPHYTA, DASYCLADACEAE) IZ DONJEG LADINIKA VELEBITA

Tokom terenskih radova koje smo vršili još 1962. godine u široj okolini Gračaca na sjeveroistočnim padinama Velebita prikupljeno je nekoliko uzoraka ladinčkih vapnenaca s presjecima krupnih vapnenačkih alga kijačastog oblika i izrazito jasne anulacije. Iz ovog materijala dobivena su samo dva kosa presjeka povoljna za odredbu koja su upućivala na njihovu pripadnost vrsti *Diplopora clavaeformis* Pia. Međutim, neke značajke u spomenutim presjecima dijelom su odstupale od opisa kakvog ga je za navedenu vrstu dao J. Pia (1920, str. 68—71). Insistiranje da se iz materijala prikupljenog tom prilikom dobiju novi povoljni presjeci nije dalo pozitivne rezultate. Zbog toga dalje izučavanje ove vapnenačke alge ostavljeno je za neku kasniju priliku, do eventualno nekog novog nalaza. Već prilikom izrade prvih preparata zapaženo je da se primjerci ove alge nalaze uz donju površinu slojeva što je znatno umanjivalo mogućnost novih nalaza. Značajni momenat koji je ipak ostavljao perspektivu daljih nalaza otvorenom odnosio se na specifične ali lokalne litološke odlike dobro uslojenih tamnih i dijelom piritiziranih mikritskih vapnenaca donjeg ladinika koje se pretpostavljalo naći tokom narednih istraživanja. Kako tip ovih vapnenaca, pa ni ova alga nisu više zapaženi, premda je kroz naredne godine obrađeno područje ladinika što se od Gračaca proteže na sjeverozapad u dužini preko 80 km, preostalo je da se pokuša ponovo naći već utvrđeni lokalitet, što je realizirano tek 1973. godine, kada sam s kolegom I. Velićem uspio prikupiti veći broj lijepo očuvanih primjeraka.

Dosadašnje poznavanje ove vrste svodi se isključivo na opis što ga je dao Pia (1920) na jednom nepotpuno očuvanom primjerku koji potječe iz vapnenaca *Trinodosus*-slojeva s lokaliteta Bare (Zli Stup) kod Han Buloğa u Bosni. Uzme li se u obzir da je i taj jedan nepotpuni primjerak dijelom zahvaćen rekristalizacijom, postaje razumljivo da su neki detalji ostali slabije poznati, a drugi, premda točni, izraženi s opravdanom sumnjom. Vjerojatno da je to, kao i pomanjkanje novijeg nalaza od 1920. godine do danas, postojanje ove vrste dovelo u sumnju ili barem u situaciju diskretne primjedbe kakvu su dali Hurka & Schmid (1971, p. 512).

Diplopora clavaeformis Pia

Tab. I—IV; tab. V, sl. 1—4.

Opis. Više dobro očuvanih primjeraka ispranih na donjim površinama slojeva i većeg broja različito orijentiranih presjeka predstavlja nam ovu algu kijačastim izrazito anuliranim vapnenačkim skeletom. U osnovi oblik je

podudaran onom što ga je dao P i a (1920, str. 70, sl. 16; 1936, str. 245, sl. 55), ali se razlika uočava u građi vapnenačkog skeleta. To je izraženo lagano prema gore koso postavljenim vapnenačkim segmentima (tab. II, sl. 1). Kod ovih segmenata primjećuje se odebljanje i distalno proširivanje u vršnim dijelovima biljke u odnosu na one koje se nalaze u bazi, a koji su cijelom dužinom približno jednake debljine (tab. II, sl. 1—3; tab. IV, sl. 3). Međusobna udaljenost susjednih segmenata primjetljivo je manja u bazi nego onih u vršnom dijelu biljke. Dalja razlika od originalne rekonstrukcije vidljiva je na krajnjem dijelu biljke, gdje je njezin završetak u obliku vapnenačke kalote što odgovara jednom segmentu (tab. I, sl. 3; tab. II, sl. 1, 3). Povezanost susjednih segmenata u cjelinu vapnenačkog skeleta ostvarena je veoma tankim vapnenačkim zidom što dijeli matičnu stanicu od vanjskih udubljenja (anulacije). Debljina ovog zida dvostruko je veća u donjem nego što je to u vršnom dijelu biljke (tab. II, sl. 1; tab. IV, sl. 3). Matična stanica vrlo je prostrana i zaprema više od 2/3 ukupnog dijametra u gornjem dijelu biljke.

Ogranci karakteristični za rod *Diplopora* smješteni su u vapnenačkim segmentima tako da u svakom od njih nalazimo po jedan pršljen. Pršljen se sastoji od niza snopića formiranih od 4, a izuzetno 5 ogranaka povezanih zajedničkom bazom (tab. III, sl. 1—4). Zbog ovoga snopiće je moguće zapaziti u presjecima kroz bazu ogranka ili još neposredno uz nju prije nego dođe do njihovog razilaženja (tab. III, sl. 1—4). Ostaje nesigurno, unatoč indikacija (tab. III, sl. 2—3) da li u odebljalim i distalno proširenim segmentima vršnog dijela biljke nema i dva pršljena u kojima snopići u odnosu jednog prema drugom pršljenu stoje naizmjenično. Sigurno uočavanje eventualne prisutnosti dva pršljena ograničeno je na najviše dva segmenta, pa je ono minimalno. Prilikom razmatranja građe ogranka P i a (1920, p. 70) ostaje u dilemi kada piše: »Fragen könnte man sich sogar, ob die Poren von *Diplopora clavaeformis* nicht sekundären Wirtelästen entsprechen und die primären Äste ganz unverkalt waren. Die Stammzelle hätte dann nicht eine so enorme Dicke gehapt.« Na ovdje promatranim primjercima uočljiv je odnos ogranaka s matičnom stanicom od koje su ogranci odjeljeni veoma tankim, ne uvijek očuvanim, kalcitnim zidom ponegdje slabo izbočenim u matičnu stanicu (tab. II, sl. 1; tab. IV, sl. 3). Na osnovi ovoga može se pretpostaviti da je veza matične stanice s ogranacima ostvarena porom relativno malih dimenzija. Baze snopića ogranaka jednog pršljena gusto su stisnute i međusobno odjeljene vrlo tankom vapnenačkom pregradom. Broj snopića u jednom pršljenu gornjeg dijela biljke pretpostavlja se u iznosu 40—50. Odvajanje ogranaka već od same baze otklanja sumnju eventualnog postojanja primarnih i sekundarnih ogranaka premda se ovo pitanje čini ipak dovoljno opravdanim kada je riječ i o nekim drugim vrstama ovog roda.

Nakon što se ogranci odvoje od zajedničke osnove dolazi do njihovog razilaženja katkada i uz blago povijanje pojedinih ogranaka. U odnosu na Pijin opis ove vrste postoji znatnija razlika u formi ogranaka nakon što se odvojili od zajedničke osnove. Prema interpretaciji što ju je dao P i a, ogranci se prema van stanjuju i pripadaju trihofornom tipu. Iz ovdje prikazanog materijala forma ogranaka različita je i ovisna o dijelu gdje je vapnenački skelet zahvaćen presjekom. U nižem dijelu skeleta, koji se donekle definira općenito manjim dimenzijama i naglašeno užim vapnenačkim segmentima, ogranci se neznatno smanjuju prema van ili su na cijeloj dužini, premda relativno tanki, približno podjednake debljine (tab. III, sl. 5; tab. IV, sl. 1), što i navodi na njihov trihoforni tip. Međutim, druga forma ogranaka dolazi na odebljalim i distalno proširenim segmentima vršnog dijela biljke. Ogranci prema van postupno odebljavaju i pokazuju tendenciju formiranja vezikulifernog tipa ogranaka (tab. III, sl. 2—3; tab. V, sl. 1, 2, 4), kakvi bi se eventualno izrazitije formirani mogli naći u vapnenačkoj kaloti na samom završetku biljke.

Dimenzije u mm:

Maksimalno promatrana dužina	53
Broj segmenata na maksimalno promatranoj dužini	34
Vanjski dijametar u gornjem dijelu talusa	8,87—12,58
Unutarnji dijametar u gornjem dijelu talusa	6,29— 9,62
Vanjski dijametar u donjem dijelu talusa	5,55— 8,33
Unutarnji dijametar u donjem dijelu talusa	2,78— 4,81
Udaljenost susjednih pršljenja u gornjem dijelu talusa	2,22— 2,78
Udaljenost susjednih pršljenova u donjem dijelu talusa	1,48— 1,78
Broj snopića u jednom pršljenju	40—50
Broj ogranaka jednog snopića	4—?5
Dužina ogranaka	1,11— 1,55
Debljina ogranaka na bazi u gornjem dijelu talusa	0,10— 0,19
Debljina ogranaka vršnog dijela u gornjem dijelu talusa	0,25— 0,48
Debljina ogranaka na bazi u donjem dijelu talusa	0,09
Debljina ogranaka na vanjskom kraju u donjem dijelu talusa	0,06
Debljina vapnenačkog zida između susjednih segmenta u gornjem dijelu talusa	0,05— 0,10
Debljina vapnenačkog zida između susjednih segmenata u donjem dijelu talusa	0,18— 0,33
Širina segmenata na distalnom kraju u gornjem dijelu talusa	1,67— 2,33
Širina segmenata na distalnom kraju u donjem dijelu talusa	0,63— 0,93

Sličnosti i razlike. U građi vrste *Diplopore clavaeformis* Pia nalazimo više značajki karakterističnih za rod *Diplopore*. Svojim dimenzijama i tankom vapnenačkom stijenkama u dnu anulatnih prostora oštro se odvaja od njoj sličnih vrsta ovog roda. Već je Pia (1920) naglasio da je razlika u dimenzijama prevelika da bi se shvatila kao *D. annulatissima*, od koje se razlikuje i kijačastim završetkom talusa. Uz ove razlike novim materijalom moguće je utvrditi da se *D. clavaeformis* od *D. annulatissima*, s kojom je u nekim presjecima kroz donji dio talusa najbližnja, razlikuje i oblikom ogranaka. Zajednička odlika ovih dviju vrsta je u pravilu samo jedan pršljen u svakom segmentu, premda se pretpostavka od dva pršljena u posljednjem segmentu ili možda i slijedećem nižem kod ovdje opisane vrste čini opravdana.

Ako se *D. clavaeformis* usporedi s vrstom *D. praecursor* Pia prema opisu što su ga za ovu drugu dali Hurka & Schmid (1971), razlike su očite i zamjena ovih vrsta ni u kojem slučaju nije moguća. Razlike su vidljive donekle iz njihovih dimenzija i oblika vapnenačkog skeleta postupnim odebljavanjem vršnog dijela u vrste *D. clavaeformis* i nešto naglijeg, u obliku mješine, kod *D. praecursor*. Segmentacija kod *D. clavaeformis* znatno je izrazitija, a bitno se razlikuje od *D. praecursor* oblikom ogranaka i brojem ogranaka jednog snopića. Vrsta *D. clavaeformis* ima 4 ogranaka u jednom snopiću a u pojedinim slučajevima moguće i 5, što je kod *D. praecursor* ograničeno na 2 ili izuzetno 3 (Hurka & Schmid, 1971). Manje sličnosti moguće je naći i s nekim drugim vrstama, ali postojanje oštrih razlika isključuje potrebu dalje analize.

Unatoč razlika koje su ovdje uočene u odnosu na opis što ga je dao Pia (1920), nije dovedena u pitanje pripadnost ovog materijala vrsti *D. clavaeformis* Pia, pa se cjelokupna nova zapažanja mogu smatrati dopunom prvobitnog opisa.

Stratigrafski položaj: Prikazana vrsta nađena je na sjeveroistočnim padinama Velebita zapadno od Rastovače (južno od Gračačkog polja) u tamnosivim mikritskim vapnencima nižeg ladinika. Na pripadnost ovih naslaga donjem ladiniku ukazuje njihova superpozicija i više dobro očuvanih presjeka vrste *Diplopora annulata* Schafh., koja je zastupana s obje podvrste.

Rijetki nalazi vrste *D. clavaeformis*, kojoj je ovo tek drugi utvrđeni lokalitet, mogu se objasniti njezinom nježnom građom za čije očuvanje su potrebni izrazito povoljni uvjeti sedimentacije. Relativno mirna sredina djelomično reaktivnih uvjeta sedimentacije ostvarena je lokalno i slučajno, a odražava se u biomikritima s vrlo sitnim biogenim detritusom uz fino dispergirani primarni pirit koji je naknadno limonitiziran.

Primljeno 27. 03. 1974.

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PLATE — TABLA I

Dnplopora clavaeformis Pia

- 1—2. Longitudinal-tangential section through the club-shaped region (Uzdužni tangencijalni presjek kroz kijačasti dio biljke), 1=x2,5; 2=x2.
- 3—4. Weathered part of skeleton in the club-shaped region (Isprani erodirani skelet kijačastog dijela biljke), 3=x2,6; 4=x2,7.

Taken by (Foto): I. Buzjak



PLATE — TABLA II
Diplopora clavaeformis P i a

- 1, 3. Longitudinal section through the club-shaped region (uzdužni presjek kroz kijačasti dio skeleta),
Slide (izbrusak) 1=OB 583/9, x7,2; 2=OB 583/12, x5.
2. Oblique section (kosi presjek)
Slide (izbrusak) OB 583/11, x4,9.

Taken by (Foto): Ž. Mikša

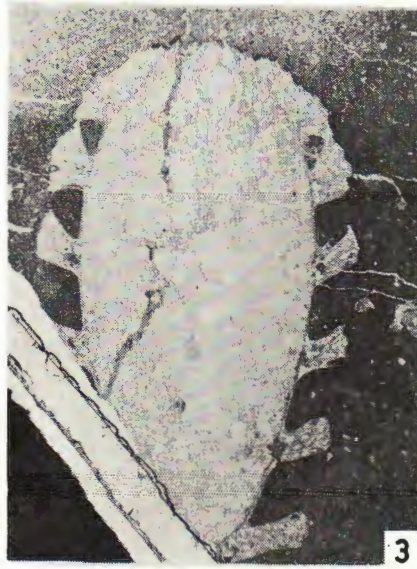
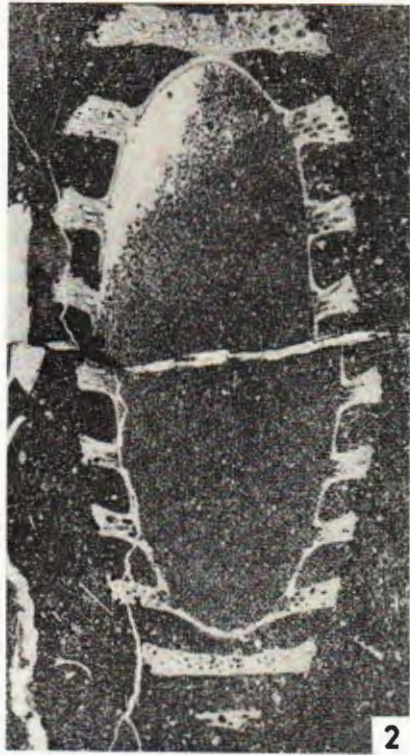
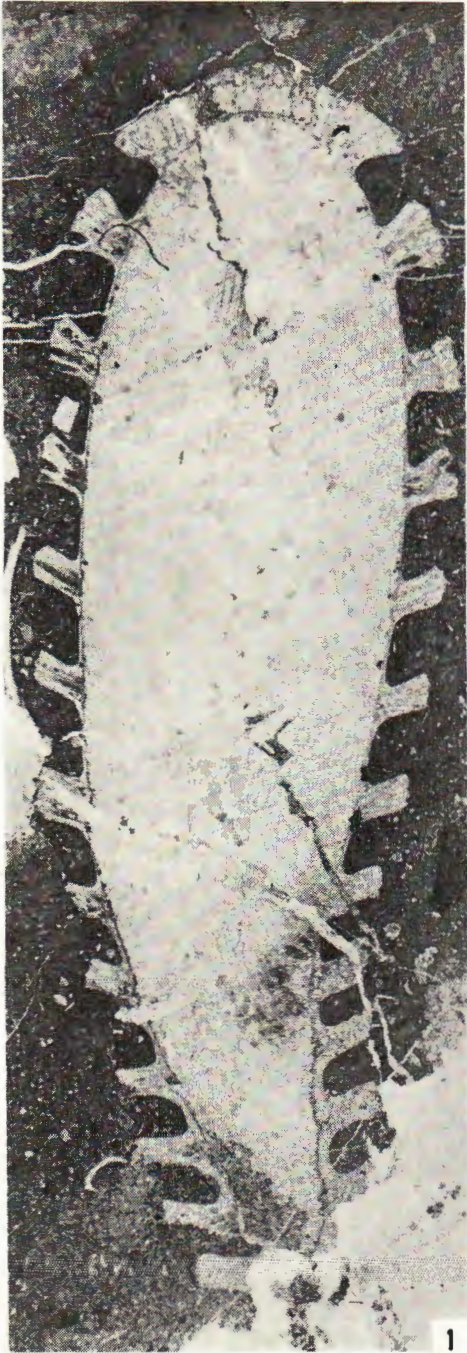


PLATE — TABLA III
Diplopora clavaeformis Pia

1—5. Oblique sections (kosi presjeci)

Slides (izbrusci) 1 = OB 583/1, x7,2; 2 = OB 583/6, x4,9 3 = OB 583/2, x4,9;
4 = OB 583/5, x4,7; 5 = OB 583/10, x5.

Taken by (Foto): Ž. Mikša

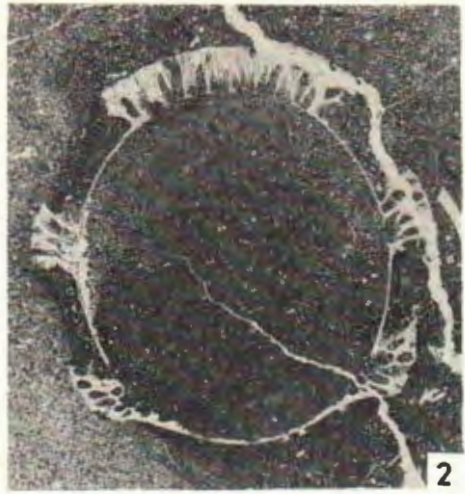
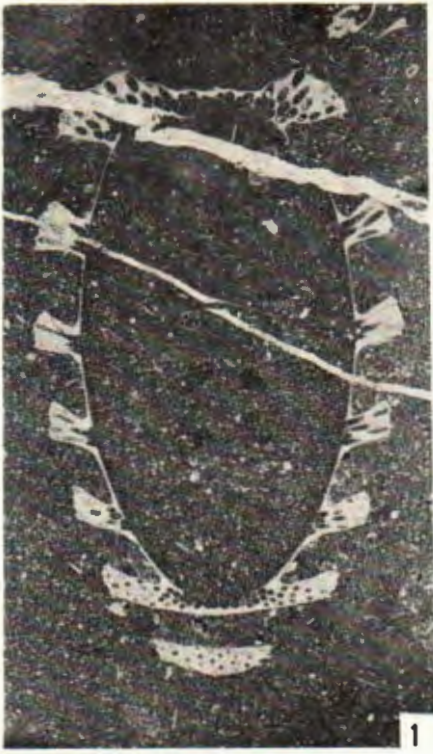


PLATE — TABLA IV
Diplopora clavaeformis Pia

- 1—2. Oblique sections (kosi presjeci)
Slides (izbrusci) 1=OB 583/14, x9,6; 2=OB 583/7, x7,6.
3. Longitudinal section (uzdužni presjek)
Slide (izbrusak) OB 583/8, x3,8.

Taken by (Foto): Ž. Mikša



1

2

3

PLATE — TABLA V

1—4. *Diplopora clavaeformis* P i a

- 1, 3. Longitudinal section through one segment (uzdužni presjek kroz jedan segment)
Slides (izbrusci) 1=OB 583/8, x17,3; 3=OB 583/5, x18.
- 2, 4. Oblique section through one segment (kosi presjek kroz jedan segment)
Slide (izbrusak) OB 583/6, x20,7.
5. *Diplopora annulata* S c h a f h.
Longitudinal-oblique section (uzdužno-kosi presjek)
Slide (izbrusak) OB 583/15, x3,5.
6. Biopelmicrosparite with fragments of *Diplopora annulata* S c h a f h. (biopelmikrosparit s fragmentima vrste *Diplopora annulata* S c h a f h.)
Slide (izbrusak) OB 583A, x5.

Taken by (Foto): Ž. Mikša

