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FROM THE MIDDLE TRIASSIC OF VELEBIT

NOVI ROD VAPNENAČKE ALGE IZ SREDNJEG TRIJASA  
VELEBITA

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## A NEW GENUS OF CALCAREOUS ALGAE FROM THE MIDDLE TRIASSIC OF VELEBIT

*With 1 text-figure and 4 plates*

A new genus of calcareous algae from the family Dasycladaceae deriving from the Middle Triassic of Velebit, represented by the species *Favoporella annulata* n. gen. n. sp., has been described. The form of its branches at their distal part imparts a honey-comb appearance to the surface of the thallus. According to the superposition of the stratum typicum, this alga would belong to the Upper Anisian or, maybe, to the Lower Ladinian.

Triassic beds, discovered in the vast space of Velebit Mountain in normal superposition build mostly its north-eastern slopes. Middle Triassic limestones and dolomites are richest in fossil remains, calcarenites and biocalcarenites compose the bulk of limestones; calcilutites, regularly poor in fossils, are somewhat scarcer; and dolomites with traces of calcarenite and organic structure, which are due to diagenesis, are mostly sterile. Within the great number of the samples, in 80 — 90% cases the fossil contents consist of calcareous algae tied to single layers or nests. Single specimens are to be found in almost any parts of the layers. On the occasion of the 1963 field work on the ridge SSW of Počitelj, a locality of dark grey limestone was discovered: it contained a great number of big, variously oriented specimens of calcareous algae, apparently very similar to the species *Diplopora annulatissima* P i a. By a comparative study, differences between them were established, but further exploration required a great number of sections, which finally made it possible to determine morphological and anatomical characteristics of this new Middle Triassic algal genus and species.

I thank to Professors V. Kochansky-Devidé and to M. Herak for their advices during the preparation of this paper.

### Systematic description

Family *Dasycladaceae*

Genus *Favoporella* n. gen.

This genus is represented for the time being only by the type species *F. annulata* n. sp.

The basic characteristics of the genus concern the form and the distribution of branches. The proximal part of the undivided branches has a broad basis, which is often similar to a slightly deformed cone or to the basis of a thorn. Hence their distribution in alternated whorls may be concluded. After the broad basis, branches taper very much, but in the terminal part of the segment they widen suddenly again, like a funnel. Separated from each other only by a thin calcareous membrane, they squeeze and warp forming the structure of an irregular honey-comb appearance. Hence the name of the new genus (Lat. *favus* = honey-comb).

*Favoporella annulata* n. sp.

Plate I—IV

? 1963. *Diplopora annulata*, Ott, Fig. 16

The thallus consists of a series of segments divided by deep, well expressed furrows. The segments, slightly widened at the basis, and more intensively at their external part, most often completely close the furrows, which remain like hollow rings between the segments and hence in longitudinal sections they mostly give the form of an elongated, more or less irregular ellipse (Pl. I, Fig. 1; Pl. II, Fig. 1, 2; Pl. IV, Fig. 4) or, in extreme cases, of an irregular circular form (Pl. II, Fig. 4). The average width of the furrow may be approximately  $\frac{1}{3}$  greater than the width of the segment, and the width of the segments and furrows in one specimen may vary for the same relation. The segments are mildly bent upwards (Pl. I, Fig. 1) or they are, infrequently, perpendicular the main stem. The width of the main stem amounts to about  $\frac{1}{2}$  of the total diameter of the calcareous skeleton. The inner edge of the main stem is uneven because of the widened proximal parts of the branches. Such a form of the branches causes a maximum thinning of the calcareous cover at the bottom of the furrows.

The undivided branches are most remarkable for this genus and this only species known so far. By widened basis they penetrate like wedges into the calcareous mass of the segments (Pl. I, Fig. 3; Pl. III, Fig. 1, 2; Pl. IV, Fig. 4), and then suddenly taper. One gets the impression that the branches mutually touch at the basis, which means that they might not be sharply divided from each other. In spite of this, the branches are arranged in two alternating whorls. The form of the proximal part of the branches causes an uneven surface of the main stem. Suddenly tapered, the branches of 2—4 neighbouring whorls concentrate in one segment. As they depart from the main stem, the branches regularly bend sideways, coming nearer to each other in their central, thinnest part, but still keeping their alternatig position in the segment (Pl. III, Fig. 5). However, such position may be deranged. At the ex-

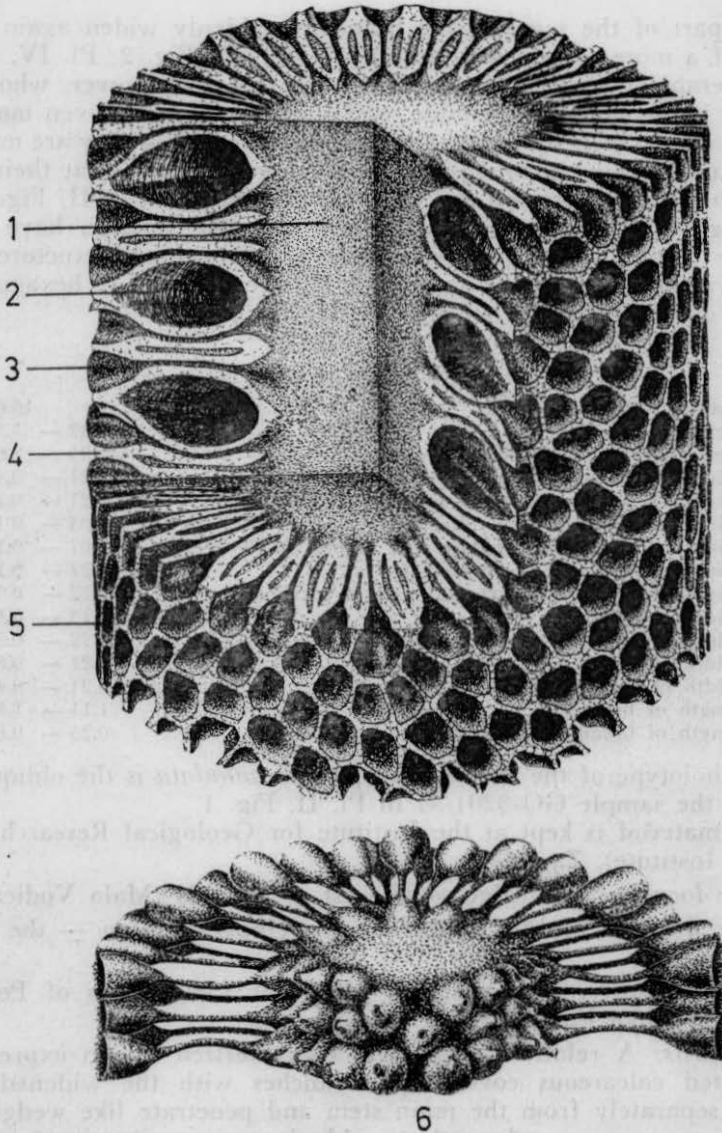


Fig. 1. Reconstruction of *Favoporella annulata* n. gen. n. sp. 1. main stem, 2. annulation, 3. branche, 4. calcareous mass of thallus, 5. honey-comb structure of outer surface, 6. branches of one segment without limestone.

Sl. 1. Rekonstrukcija alge *Favoporella annulata* n. gen. n. sp. 1. matična stanica, 2. anulacija, 3. ogranak, 4. vapnena masa talusa, 5. sačasta struktura vanjske površine, 6. ogranci jednog segmenta bez vapnenca.

Drawn by (crtao) V. Sirić

ternal part of the segment the branches suddenly widen again in the form of a more or less regular funnel. (Pl. III, Fig. 2; Pl. IV, fig. 2). Considerably widened, they penetrate the calcareous cover, whose real limit it is difficult to determine, and suddenly broaden even more and deform due to their squeezing against each other. Here they are mutually separated by thin calcareous walls, which get quite thin at their distal part, so that in cross-sections they are like thorns. (Pl. II, Fig. 4; Pl. III, Fig. 4). The branches broadened near the surface, have closed furrows giving the calcareous cover a honey-comb structure. This structure contains more or less round, elliptical, square to hexagonal, or almost quite irregular, elements (Pl. II, Fig. 3).

## Dimensions in mm:

maximal observed length	16.65
outer diameter (D)	3.42 — 5.55
inner diameter (d)	1.95 — 2.60
width of branches at basis	0.21 — 0.40
width of branches at basis on one specimen	0.21 — 0.29
width of branches at middle part	0.03 — 0.10
width of branches at middle part of one specimen	0.07 — 0.10
width of branches at external part	0.22 — 0.10
width of branches at external part of specimen	0.22 — 0.37
width of segment	0.18 — 0.55
width of segment of same specimen	0.22 — 0.55
width of furrows	0.21 — 0.89
width of furrows of one specimen	0.21 — 0.48
length of branches	1.11 — 1.30
length of broadened part of branches	0.25 — 0.63

The holotype of the species *Favoporella annulata* is the oblique section in the sample GO-3201/34 in Pl. II, Fig. 1.

The material is kept at the Institute for Geological Research (Geological Institute), Zagreb.

*Type locality*: The ridge south-west of Počitelj (Mala Vodica).

*Type stratum*: Middle limestones, the Upper Anisian — the Lower Ladinian.

*Other localities*: Lazaruša, NE of height 1330 (south of Počitelj), slopes of Velika Plana S of height 623.

*Diagnosis*: A relatively big alga, characterized by an expressively segmented calcareous cover. The branches with the widened bases depart separately from the main stem and penetrate like wedges into the calcareous cover, where they suddenly taper, and towards the external part widen again and, squeezing against each other, they close the furrows, attributing to the surface of the alga the appearance of a honey-comb structure.

*Remarks*: The species *Favoporella annulata*, and hence the genus itself, in the structure of its branches, does not manifest any similarity

with any calcareous algae described so far. However, in some sections, especially when the surface of the calcareous cover is worn out, this alga resembles to the species *Diplopora annulatissima* Pia, especially in middle-deep tangential sections, in whose segments the arrangement of pores of approximately equal dimensions is almost identical (Pl. III, Fig. 5; Pl. IV, Fig. 5). It makes impossible a precise determination. A certain similarity also exists with the distal part of the segments of the species *D. annulatissima*, if in the latter, the pores are secondarily widened by wear. However, longitudinal, oblique, and even transversal sections, disclosing the arrangement of the branches in clusters in *D. annulatissima*, respectively their extension at the basis and the end in *Favoporella annulata*, excludes any doubt in determining these two species.

Stratigraphical position: *F. annulata* n. sp. derives from dark Middle Triassic biocalcarenes. At the mentioned localities, it has not been found in association with some of the index species, which might define its Anisian or Ladinian age. Owing to the attitude of the type stratum, between the beds with Anisian algae and the beds with Ladinian forms, the beds of this alga may be considered of the Upper Anisian or perhaps of the Lower Ladinian age.

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#### B. SOKAČ

##### NOVI ROD VAPNENAČKE ALGE IZ SREDNJEG TRIJASA VELEBITA

Sedimenti srednjeg trijasa najfosiliferniji su dio trijaskih naslaga razvijenih u širokom prostoru sjeveroistočnih padina Velebita. Najvećim dijelom ovaj dio trijasa izgrađuju različiti tipovi vapnenaca i dolomit sekundarnog postanka. Fosilni sadržaj 80—90% čine vapnene alge koncentrirane na pojedine slojeve, lokalitete ili pojedini

načno gotovo na sve dijelove srednjeg trijasa. Prilikom terenskog rada 1963. g. na lokalitetu jugozapadno od Počitelja zapažena je krupna vapnenačka alga, za koju se daljnjim promatranjima na osnovu morfoloških karakteristika utvrdilo, da predstavlja novi rod.

*Favoporella* nov. gen. predstavljena je vrstom *F. annulata* n. sp. To je relativno krupna vapnenačka alga, kojoj je talus sastavljen od niza segmenata odijeljenih dubokim anulatnim depresijama. Nepodijeljeni ogranaci proširenom bazom se odvajaju od matične stanice i klinasto ulaze u segmente koji obuhvaćaju 2—3 maksimalno 4 susjedna pršljena. Ulaskom u segment ogranaci naglo stanjuju, te se pri završetku segmenta ljevkašto šire. Već prošireni napuštaju segment, te se dalje naglo proširuju. Zbog jakog proširivanja ogranaci su odvojeni tankim vapnenačkim zidom i stisnuti jedan uz drugoga, te se deformiraju. Ovo, uz širenje segmenata, u distalnom dijelu uvjetuje najčešće potpuno zatvaranje anulacije, a površina talusa dobiva građu sačastog izgleda.

Dimenzije su dane u prethodnom tekstu.

*Favoporella annulata* građom svojih ogranaka koji uvjetuju njezine specifične karakteristike i u općoj građi talusa bitno odstupa od do sada opisanih vapnenih alga. Međutim, u tangencijalnom presjeku, pogotovo ako je vanjska površina intenzivnije oštećena, dimenzijama i rasporedom pora u segmentu nalik je vrsti *Diplopora annulata* P i a s kojom ju je u tim slučajevima moguće i zamijeniti. Ostali presjeci, gdje je građa ogranaka vidljiva, kao i površina talusa isključuju ovu zamjenu.

Nova vrsta potječe iz tamnih biokalkarenita utvrđenih u Velebitu na 3 lokaliteta. Obzirom da nije nađena u zajednici s nekom od provodnih vrsta, na osnovu superpozicije u odnosu na utvrđeni anizik i ladinik, moguće je prepostaviti da pripada gornjem aniziku ili donjem ladiniku.

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PLATE — TABLA I

1 — 4 *Favoporella annulata* n. sp.

1 Slightly oblique longitudinal section,  
Malo kosi uzdužni presjek.  
Slide (izbrusak) GO — 3201/5 × 8,9

2 Tangential section.  
Tangencijalni presjek.  
Slide (izbrusak) GO — 3201/9 × 13,5

3 Cross section.  
Poprečni presjek.  
Slide (izbrusak) GO — 3201/26 × 25

4 Tangential section.  
Tangencijalni presjek.  
Slide (izbrusak) GO — 3201/6 × 8,6

Locality (nalazište) SW from Počitelj (Mala Vodica, Velebit).

Foto: V. Matz





PLATE — TABLA II

- 1 — 4 *Favoporella annulata* n. sp.  
Holotype. Oblique section.  
Holotip. Kosi presjek.  
Slide (izbrusak) GO — 3201/34 × 10,8
- 2 Longitudinal-oblique section.  
Uzdužno-kosi presjek.  
Slide (izbrusak) GO — 3201/28 × 9,4
- 3 Tangential section.  
Tangencijalni presjek.  
Slide (izbrusak) GO — 3201/1 × 21,3
- 4 Longitudinal section through three segments.  
Uzdužni presjek kroz tri segmenta.  
Slide (izbrusak) GO — 3201/8 × 24  
Locality (nalazište) SW from Počitelj (Mala Vodica, Velebit).

Foto: V. Matz



PLATE — TABLA III

- 1 — 5 *Favoporella annulata* n. sp.
- 1 Longitudinal section through two segments.  
Uzdužni presjek kroz dva segmenta.  
Slide (izbrusak) GO — 3201/40 × 24,7
  - 2 Longitudinal section through one segment.  
Uzdužni presjek kroz jedan segment.  
Slide (izbrusak) GO — 3201/25 × 26,7
  - 3 Longitudinal section.  
Uzdužni presjek.  
Slide (izbrusak) GO — 3201/33 × 8,3
  - 4 Longitudinal section through three segments.  
Uzdužni presjek kroz tri segmenta.  
Slide (izbrusak) GO — 3201/33 × 29,6
  - 5 Tangential section.  
Tangencijalni presjek.  
Slide (izbrusak) GO — 3201/28 × 26,9  
Locality (nalazište) SW from Počitelj (Mala Vodica, Velebit).

Foto: V. Matz



PLATE — TABLA IV

1 — 5 *Favoporella annulata* n. sp.

1 Oblique section.

Kosi presjek.

Slide (izbrusak) GO — 3201/36 × 27

2 Longitudinal section through one segment.

Uzdužni presjek kroz jedan segment.

Slide (izbrusak) GO — 3201/39 × 27

3 Oblique section.

Kosi presjek.

Slide (izbrusak) GO — 3201/27 × 25,3

4 Longitudinal section through one side.

Uzdužni presjek kroz jednu stranu.

Slide (izbrusak) GO — 3201/28 × 31

5 Tangential section.

Tangencijalni presjek.

Slide (izbrusak) GO — 3201/35 × 28,8

Locality (nalazište) SW from Počitelj (Mala Vodica, Velebit).

Foto: V. Matz

