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SALOPEKIELLA? BREZIKI N. SP. (CALCAREOUS ALGAE, DASYCLADACEAE) FROM THE PERMIAN OF MT. VELEBIT (CROATIA)

A dasyclad alga with one-whorled calcareous segments, probably belonging to the genus *Salopekiella*, has been described from the Permian sediments of Mt Velebit.

INTRODUCTION

Paleozoic sediments of the northeastern slopes of Mt. Velebit, in the Lika region (Croatia), are extremely fossiliferous. A number of new taxons has already been desribed by R. Schubert, V. Kochansky-Devide, M. Herak, and M. Milanović. A new species of calcareous algae (family Dasycladaceae) has recently been discovered in the samples originating in the neighbourhood of Brezik village. Several new taxons have already previously been established from the same material.

SYSTEMATIC DESCRIPTION

Phylum Chlorophyta

Family Dasycladaceae Kützing, 1843; orth. mut. Stizenberger, 1860

Tribe Diploporeae? Pia, 1927

Genus *Salopekiella* Milanović, 1965

Salopekiella? breziki n. sp.

Plates I–III

Origin of the name: The specific name derives from the village of Brezik, on the northeastern slopes of Mt. Velebit, which yielded the rich microfossil material.

Holotype: Section in the sample U-4012/1, shown in Pl. I, fig. 2.

Diagnosis: A species of the genus *Salopekiella* with a corrugated outer surface of the segments and one whorl of branches in each segment.

Type-locality: Brezik village, about 2 km southwest of Medak, i. e. about 15 km southeast of Gospić, Lika.

Age: Middle to Upper Permian (Upper Artinskian to Lower Kazanian).

Description: The calcareous skeleton of this alga consists of segments which partly enter into each other. Due to more or less advanced recrystallization, or other reasons, the segmentation is not clearly visible in all specimens. It is best visible in the holotype, as well as in some other sections (Pl. I, fig. 3; Pl. III, fig. 2).

The segments are of a hemispherical or paraboloid shape. Their diameter is about twice their height, i. e. D/h = 1.76-2.11. The outer surface of the segments appears to be corrugated, which results in transversal sections similar to *Mizzia cornuta* Kochansky & Herak (1960), as may be seen in Pl. I, figs. 4 and 5.

The main stem is cylindrical and rather wide. Its diameter is almost twice the wall thickness in the thickest part. Small spherical or elipsoid corpuscules have been noticed sporadically within the main stem – probably sporangia (Pl. II, figs. 4 and 6).

Wide branches, arranged in whorls (verticills), issue from the main stem. They are of about the same diameter all along their length, or sligthly widen distally (Pl. I, fig. 1). The branches are open at the outer surface, though in some specimens they seem to be closed within the calcareous wall (Pl. I, figs. 3, 4). This can probably be explained assuming that the plane of the section does not cut through the middle of the branch, but somewhat in front of, or behind it. In addition, sometimes the openings of the branches are obscured by recrystallization, though they are, in general, rather well visible (Pl. III, figs. 2, 3, 4).

In the third segment (from above) of the specimen figured in Pl. I, fig. 3, there seem to be two branches present, issuing from an identical starting point, like a tuft in *Diplopora*. Since this feature was observed only in one specimen and only an one side of a segment, it can possibly be regarded as a destroyed and afterwards eroded and recrystallized part. Moreover, this part of the segment – in relation to both the other segments and the other side of the same segment – seems irregular: it looks as if it is deformed, or »doubled«. Because of that irregularity, as well as because of the specimens with closed branches, the generic attribution of that species is accompanied by a question-mark.

The branches are situated obliquely to the main stem, forming an angle of about 35–45°. Around the open end of the branches, tiny, radially directed, pores can be seen, similar to what has been observed in some specimens of *Mizzia velebitana* Schubert (Pl. I, figs. 1, 4).

Dimensions in mm:

Slide No.	D	d	s	s_1	h	p	Remarks
U-4012/1	0.53	0.30	0.08	0.12	0.30	0.06	5 segments (holotype)
U-4012/2	0.60	0.33				0.15	Oblique-longitud. section
U-4012/3	0.57	0.28	0.09	0.17	0.26	0.08	9 segments
U-4012/5	0.92	0.60				0.07	Oblique-longitud. section
U-4012/6	0.90	0.60				0.08	Transversal section
U-4012/7	1.14	0.75				0.08	Oblique-longitud. section
U-4012/10	0.93	0.48				0.08	Oblique-longitud. section
U-4012/11	0.55	0.30				0.09	Oblique-longitud. section
U-4012/A_1	0.60	0.23	0.05	0.16	0.32	0.06	3 segments
U-4012/A_2	0.70	0.35	0.08	0.17	0.35	0.09	4 segments
U-4012/A_3	0.48	0.30	0.05	0.09	0.23	0.05	4 segments
U-4012/A_4	0.50	0.33				0.06	Transversal section
U-4012/A_5	0.75	0.45				0.08	Transversal section

D = Outer diameter
d = Diameter of the main stem
s = Wall thickness in the lower part
s_1 = Wall thickness in the thickest part
h = Height of segments
p = Diameter of the pores

Remarks and discussion: In transversal sections, this new species resembles some species of *Gyroporella, Physoporella,* and *Mizzia,* respectively. The segmented thallus makes the difference from *Gyroporella* and *Physoporella,* and the shape of the segments and the open branches make the difference to *Mizzia. Salopekiella? breziki* is also similar to Upper Cretaceous *S. inopinata* Gušić, (1967), from which it differs by the shape of the segments and by having only one whorl of branches (there are two whorls in *S. inopinata).* A certain degree of similarity exists, also, between *S.? breziki* and *Clavaporella caliciformis* Kochansky & Herak (1960): However, *S.? breziki* has only one whorl of branches and the branches are not arranged in tufts, which differentiates it from *C. caliciformis.*

Stratigraphical position: *S.? breziki* has so far been found in only a few dolomite samples, accompanied by: *Mizzia velebitana* Schubert, *Velebitella triplicata* Kochansky-Devidé, *Salopekiella velebitana* Milanović, *Kochanskyella tulipa* Milanović, *Neoschwagerina craticulifera* (Schwager), etc.

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M. MILANOVIĆ

SALOPEKIELLA? BREZIKI N. SP., (VAPNENAČKE ALGE, DASYCLADACEAE) IZ PERMA VELEBITA

Sedimenti velebitskog paleozojskog prodora, osobito su fosiliferni. Radovima R. Schuberta, V. Kochansky-Devidé, M. Heraka i M. Milanovića, opisano je već mnogo novih taksona. Izradom novih preparata iz ranije korištenih lokaliteta kod sela Brezik, omogućilo je otkrivanje nove vrste.

Familia Dasycladaceae Kützing 1943, orth. mut. Stizenberger, 1860

Tribus Diploporeae? Pia, 1927

Genus *Salopekiella* Milanović, 1965

Salopekiella breziki n. sp.

Porijeklo imena: Ime vrste dano je prema selu Brezik na padinama Velebita, odakle su najvećim dijelom uzorci stijena nove vrste i drugih, ranije opisanih taksona.

Holotip: Uzorak U-4012/1 Tab. I, sl. 2.

Dijagnoza: *Salopekiella* sa naboranim segmentima (izvana) i jednim pršljenom u segmentu.

Lokalitet: Selo Brezik na sjeveroistočnoj padini Velebita.

Starost: Srednji-gornji perm (od gornjeg artinska do donjeg kazana).

Opis: Skelet alge sastavljen je od niza segmenata koji se naslanjaju i manjim dijelom ulaze jedan u drugi. Segmentirana građa talusa nije na svim uzorcima vidljiva uslijed jače ili slabije rekristalizacije ,ili drugih uzroka. Ipak ona je vidljiva na holotipu i dijelom na drugim primjercima (tab. I, sl. 3; tab. III, sl. 2).

Segmenti su polukuglastog odnosno paraboloidnog oblika. Promjeri segmenata prema visinama istih su otprilike dvostruko veći, tj. D/h iznosi 2,11—1,76. Izvana su segmenti vjerovatno naborani, te su zbog toga poprečni prerezi slični vrsti *Mizzia cornuta* Kochansky & Herak (1960), što se vidi na slikama 4 i 5 table I.

Matična stanica je cilindrična, široka. Ona je većinom dvostruko šira nego stijenka na najširem dijelu. Mjestimično su u matičnoj stanici primjećena okrugla ili elipsoidna tijela — možda sporangiji (tab. II, sl. 4 i 6).

Iz matične stanice nastavljaju se pršljenasto poredani, također široki ogranci. Oni su istog promjera cijelom dužinom, ili se pri vrhu proširuju (tab. I, sl. 1.). Ogranci su otvoreni, iako se na nekim primjercima čini da su zatvoreni (tab. I, sl. 3 i 4). Ravnina presjeka nije (u ovim slučajevima) išla ogrankom, već iza, ili ispred njega. Uz to, spomenuta rekristalizacija onemogućila je bolju vidljivost otvora ogranaka, mada je ova vidljiva (tab. III, sl. 2, 3 i 4).

Na trećem segmentu (odozgo) primjerka na tabli I, slika 3., izgleda kao da se dva ogranka spajaju, slično snopiću diploporâ. Budući da je to prisutno samo na ovom primjerku i samo na jednoj strani istog segmenta, moglo bi se smatrati oštećenim a zatim erodiranim i rekristaliziranim dijelom. Uz to, taj dio segmenta, u odnosu na druge pa i na isti segment s druge strane, nije pravilan — deformisan je, izgleda kao da je »dvostruki«. Pa ipak, zbog ovog, kao i primjeraka sa zatvorenim ograncima, stavljen je iza oznake roda upitnik.

Ogranci s osi matične stanice zatvaraju kut od 35-45°. Oko otvora ogranaka, nalaze se male, radijalno usmjerene pore, slično kao kod vrste *Mizzia velebitana* Schubert (tab. I, sl. 1 i 4).

Dimenzije u mm:

U—4012/1	0,53	0,30	0,08	0,12	0,30	0,06	5 segmenata (holotip)
U—4012/2	0,60	0,33				0,15	Kosouzdužni prerez
U—4012/3	0,57	0,28	0,09	0,17	0,26	0,08	9 segmenata
U—4012/5	0,92	0,60				0,07	Kosouzdužni prerez
U—4012/6	0,90	0,60				0,08	Poprečni prerez
U—4012/7	1,04	0,75				0,08	Kosouzdužni prerez
U—4012/10	0,93	0,48				0,08	Kosouzdužni prerez
U—4012/11	0,55	0,30				0,09	Kosouzdužni prerez
U—4012/A$_1$	0,60	0,23	0,05	0,16	0,32	0,06	3 segmenta
U—4012/A$_3$	0,70	0,35	0,08	0,17	0,35	0,09	4 segmenta
U—4012/A$_3$	0,48	0,30	0,05	0,09	0,23	0,05	4 segmenta
U—4012/A$_4$	0,50	0,33				0,06	Poprečni prerez
U—4012/A$_5$	0,75	0,45				0,08	Poprečni prerez

D = Vanjski promjer
d = Promjer matične stanice
s = Debljina stijenke u donjem dijelu
s$_1$ = Debljina stijenke u najširem dijelu
h = Visina segmenta
p = Promjer pora

Osvrt i diskusija: Nova vrsta svojim poprečnim presjecima podsjeća na vrste rodova *Gyroporella, Physoporella,* odnosno *Mizzia.* Segmentiranim talusom onemogućuje se zamjena s vrstama rodova *Gyroporella* i *Physoporella,* a oblikom segmenata i otvorenim ograncima s vrstama roda *Mizzia. Salopekiella breziki* također je slična gornjokrednoj *S. inopinata* Gušić (1967). Od iste se razlikuje oblikom segmenata i jednim pršljenom ogranaka (*S. inopinata* ima 2.). Također postoji sličnost *S. breziki* i vrste *Clavaporella cali-*

ciformis Kochansky & Herak (1960). S obzirom da nova vrsta ima samo jedan pršljen ogranaka a ne više, niti povezane u snopiće kao C. *caliciformis*, poistovećivanje nije moguće.

Salopekiella breziki nađena je za sada samo u par uzoraka dolomita, u kojima su još i slijedeće vrste: *Mizzia velebitana* Schubert, *Velebitella triplicata* Kochansky-Devidé, *Salopekiella velebitana* Milanović, *Neoschwagerina craticulifera* (Schwager) itd.

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PLATE — TABLA I

1—4 *Salopekiella breziki* n. sp.

1. U — 4012/3 X 31
2. U — 4012/1 X 70 Holotype — holotip
3. U — 4012/A/2 X 60
4. U — 4012/A/3 X 78


1


2


3


4

PLATE — TABLA II

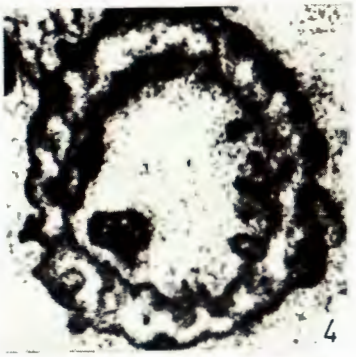
1 — 6 *Salopekiella breziki* n. sp.

1. U — 4012/A/3 X 70
2. U — 4012/1 X 70
3. V. P. 1.X 45
4. U — 4012/6X 48
5. U — 4012/A/4 X 76
6. U — 4012/A/5 X 65


1


2


3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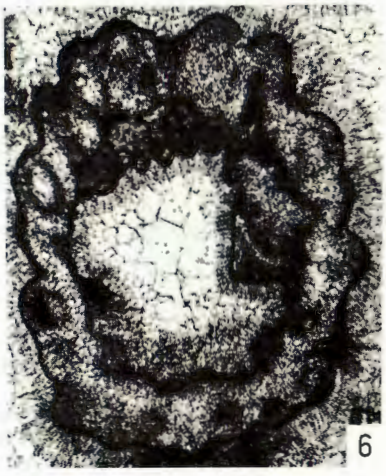
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PLATE — TABLA III

1 — 4 *Salopekiella breziki* n. sp.

1. U — 4012/7 X 32
2. U — 4012/1 X 51
3. U — 4012/11 X 38
4. U — 4012/1 X 80


1


2


3


4