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LIKANELLA – A NEW PERMIAN GENUS OF THE FAMILY
DASYCLADACEAE

With 4 plates

In the Permian deposits of Velebit Mountain in Yugoslavia was discovered a new genus of algae from the family *Dasycladaceae*. *Likanella spinosa* is described as the first species of the new genus.

The Younger Palaeozoic deposits of Velebit Mountain are well known by their abundance in micro-organisms. Besides the already known genera and species another new genus from the family *Dasycladaceae* was discovered.

I am much obliged to Professors Dr. V. Kochansky-Devide and Dr. M. Herak for their suggestions and advices.

To my colleagues, M. Sci. L. Nikler and B. Sokač, and to the geologists, A. Ivanović and A. Šušnjara, go my sincerest thanks for the most interesting material and literature they placed at my disposal.

Familia *Dasycladaceae* Kützing 1843, orth. mut. Stizenberger
1860

Tribus *Diploporeae* ? Pia 1927

Genus *Likanella* n. gen.

The name of the genus has been given after the province of Lika, Yugoslavia, from where the first specimens of the new genus originate.

The type of the genus is the species *Likanella spinosa* n. sp.

Diagnosis of the genus: The thallus is composed of loosely connected cylindrical segments, which at their lower end possess 3 whorls of branches. The long branches which at the top are open and non-ramified have separate calcareous walls. In the walls of the main stem and of branches there are to be found fine pores.

One species is described, whose specimens were discovered on the north-eastern and south-western slopes of Velebit Mountain, Yugoslavia.

Likanella spinosa n. sp.

Pl. I-IV

Description: The calcareous wall of this small alga is composed of a series of segments elongated and cylindrical in shape. The upper part of each segment possesses cylindrical walls to which the next segment is connected, while on the lower part there are branches. The connection between individual segments is very weak, so that only rarely 2-3 of them are to be found together. Oftentimes also branches were separated from the main stem or were broken, especially through re-depositing.

The main stem is big, cylindrical, and elongated. From it issue non-ramified branches, whose canal openings are big and circular in shape. Each branch has a separate calcareous wall. Terminal canal openings are only insignificantly smaller in diameter than the widest canal diameter. The number of branches in one whorl varies from 8-20.

Branches are arranged in 3 whorls. Most frequent is the alternate arrangement of branches, although they can also be arranged without a definite regularity. Varying is the position of branches in relation to the vertical axis of the main stem. The upper series of branches stands at an angle of 15° - 30° with the vertical axis. The middle series forms with the vertical axis an angle of 60° - 90° , which means that this series of branches can also be in a horizontal position. The lower series of branches is sloping a little downwards, i. e., it makes an angle of 110° - 140° with the vertical of the axis.

Branches are in the form of hollow elongated defective cones; they resemble large thorns - hence the name. If there were any assimilators, it is probable - in view of the size of the opening of branches - that they were thickened and certainly ramifying.

The size of segment varies. Segments nearer to the rhizoid are thicker and more massive, while those nearer to the distal end are thinner, more elongated and with fewer branches. Usually the height of segments is greater than the width (considering also the length of calcified branches). The ratio L/D amounts to 1.1 : 1 - 1.4 : 1, most frequently it is 1.2 : 1.

The length of articles amounts to 0.98 - 1.85 mm., most frequently it is 1.5 mm. The diameter of the widest parts of the thallus (including branches) varies from 0.82 - 1.5 mm. The diameter of the lumen ranges from 0.20 - 0.45 mm., usually about 0.30 mm. The thickness of the wall of the main stem varies. In the upper part of segments, without branches, the thickness of the wall varies from 0.03 - 0.05 mm. In the lower part it amounts to 0.07 - 0.12 mm.

The length and the diameter of branches are also very different. The measured lengths of branches are probably not exact, because branches were certainly longer. By fossilization, especially re-depositing, they were broken, i. e. shortened. The lengths of the branches that were

measured amount to 0.30 – 0.45 mm. The diameters of branches in their side and top parts also vary in view of the fact that branches become uniformly thinner towards their top. The diameter of branches at the base is from 0.15 – 0.22 mm., and at the top from 0.12 to 0.16 mm.

In the calcareous wall it was possible to notice very fine pores.

Syntypes: Specimens represented in Plate 2, Figs. 1–7.

Occurrence and Age: Light-grey to dark-grey limestones and dolomites, in which the described species was found, come from numerous finding-sites on the north-eastern and south-western slopes of Veľebit Mountain (Lika, Croatia). They are: Raduč, Okić, Ošljak, Meduvode, Brušane, Paklenica, Kontinovo Vrelo etc. The accompanying fossils are *Mizzia velebitana* Sch ubert, *M. yabei* (Karpinski), *Atractyloopsis* sp., *Permocalculus tenellus* (Pia), *Veľebitella triplicata* Kochansky - Davidě, *Hemigordius* sp., *Kahlerina pachytheca* Kochansky - Ramovš, *Neoschwagerina* sp., etc. Age: Middle-Upper Permian.

Remarks: It was impossible to classify the described alga into any of the known genera of the family *Dasycladaceae*, although efforts were made in the beginning to do so. By its morphologic characteristics the new species resembles somehow the Jurassic species *Actinoporella podolica* (Alth), which also has a segmented thallus and separately calcified branches. The differences lie in the form of segments in general and in the arrangement of branches. In the genus *Actinoporella* segments are shorter, and each of them possesses only one whorl of branches. The genus *Likanella* has elongated segments, which in their lower part possess 3 gathered whorls of branches. The differences are likewise clear in the shape and size of branches, in the manner of the connection of branches with the main stem, the angle between the main stem and branches (in the genus *Actinoporella* this angle is constant), the diameters of the main stems and the canal opening of branches, etc.

Tangential and oblique section of the described species can resemble the species *Johnsonia spinosa* Kord e. The differences lie in the form and size of thallus, main stem and branches. *Johnsonia spinosa* has non segmented thallus, which is composed of a handle and a spherical continuation on its top. Main stem is greater and spherical. The size, number and the arrangement of the branches differ very much. Branches are not situated in whorls, they are shorter and have spherical continuations on the distal ends (after Kordes reconstruction). The thickness of walls between main stem and branches differ very much.

Certain oblique cross-sections of the top of the thallus of the described species can resemble the genus *Mizzia*, especially the species *Mizzia cornuta* Kochansky & Herak. Confusion is apt to arise because branches can be short and remind of the elongated branches of the species *Mizzia cornuta*. Besides, in the walls of the main stem and branches of

both genera it is possible to notice fine pores. However, the longitudinal sections make all confusion impossible, because the differences are very clear.

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M. MILANOVIĆ

LIKANELLA - NOVI PERMSKI ROD FAMILIJE DASYCLADACEAE

Prigodom snimanja Osnovne geološke karte područja Velebita sakupljeni su i uzorci paleozojskih stijena u kojima je pored drugih fosila otkriven i novi rod.

Zahvalan sam profesorima dr V. Kochansky-Devidé i dr M. Heraku na savjetima, a mag. geol. L. Nikleru i B. Sokaču i geolozima A. Ivanoviću i A. Šušnjari na ustupljenom materijalu i literaturi.

Likanella n. gen. je mala alga familije *Dasycladaceae*. Typus roda je vrsta *Likanella spinosa* n. sp. Talus alge sastoji se od rahlo vezanih izduženo-valjkastih segmenata, koji na svom donjem dijelu imaju tri pršljena ogranaka. Dugi, nerazgranjeni ogranci, koji su na vrhu otvoreni, slični su velikim bodljama - otuda ime vrste. Svaki ogranak ima poseban vapneni ovoj. Broj ogranaka u jednom pršljenu varira od 8-20. U stijenama vapnenog ovoja matične stanice i ogranaka primijećene su fine pore.

Karbonatni sedimenti, u kojima je nađena opisana vrsta potječu s mnogih nalazišta sjeveroistočnih i jugozapadnih padina Velebita: u okolici Raduča nađena je s vrstama *Mizzia velebitana* Schubert, *Velebitella triplicata* Kochansky-Devidé, *Neoschwagerina* sp. i dr. Sa sličnim pratećim fosilima nađena je i kod Okića, Ošljaka, Međuvoda, Paklenice, Velikog Bešlina, Kontinovog vrela i dr.

Likanella spinosa n. sp. pokazuje izvjesnu sličnost s jurskom vrstom *Actinoporella podolica* (Alth), koja također ima segmentirani talus i posebno ovapnjene ogranke, ali oblik segmenata, broj i raspored ogranaka u jednom članku, kao i ostale morfološke karakteristike jasno ističu razliku ovih rodova.

Tangencijalni i kosi presjeci opisane vrste mogu biti slični vrsti *Johnsonia spinosa* K o r d e. Međutim obe vrste se razlikuju u obliku i veličini talusa, matične staniice i ogranaka. *Johnsonia spinosa* ima nesegmentirani talus u obliku drška sa sferičnim nastavkom na vrhu. Broj veličina i raspored ogranaka također se veoma razlikuju. Ogranci nisu smješteni u pršljene, kraći su i prema rekonstrukciji K. K o r d e, imaju kuglasti završetak.

Neki kosi i tangencijalni presjeci opisane vrste mogu biti donekle slični vrsti *Mizzia cornuta* K o c h a n s k y & H e r a k, ali uzdužni presjeci otklanjaju svaku zamjenu.

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PLATE - TABLA I

1-6. *Likanella spinosa* n. gen. n. sp.

1-2. Transversal sections.
Poprečni presjeci.

3-4. Oblique sections.
Kosi presjeci.

5-8. Longitudinal sections.
Uzdužni presjeci.

9. Reconstruction of two segments.
Rekonstrukcija dvaju segmenata.

10. Reconstruction of living alga.
Rekonstrukcija žive alge.

For all figures, except fig. 10, the left measurement is valid.

Za sve slike, izuzev slike 10, važi lijevo mjerilo.

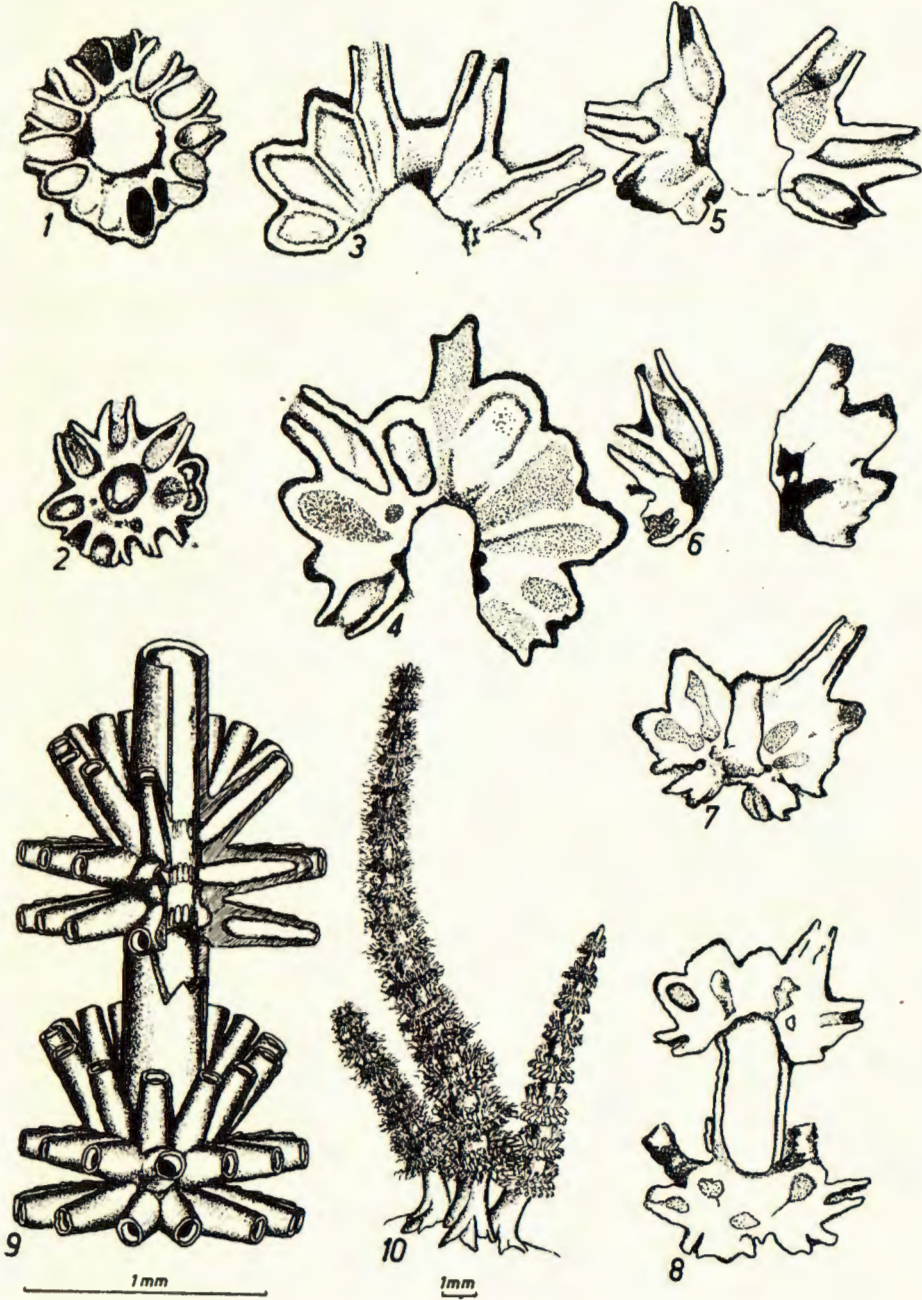


PLATE - TABLA II

1-7. *Likanella spinosa* n. gen. n. sp., Syntypes.

1. Longitudinal-oblique section through two segments. (Br.-8b/3) \times 30.
Uzdužno-kosi presjek kroz dva segmenta.
- 2-3. Longitudinal sections. (Br.-8b/2; U-330/4) \times 32.
Uzdužni presjeci.
4. Longitudinal section through two segments. (U-330/4) \times 33.
Uzdužni presjek kroz dva segmenta.
5. Transversal, somewhat oblique section (8b/1 x) \times 33.
Poprečni, malo kosi presjek.
- 6-7. Longitudinal sections (Br.-8b/7; br.-8b/3) \times 32, \times 30.
Uzdužni presjeci.

Foto: V. Matz

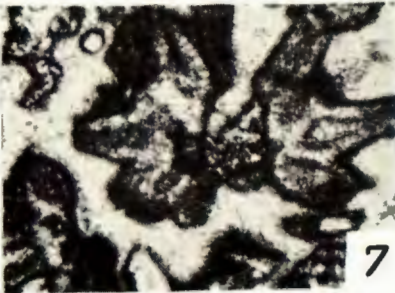
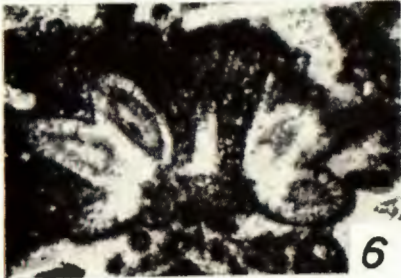
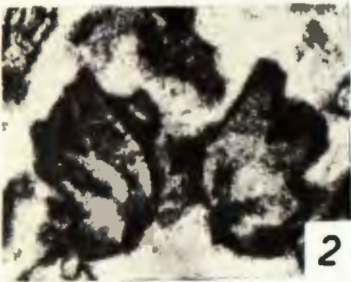
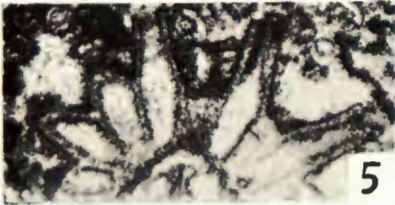


PLATE - TABLA III

1-7. *Likanella spinosa* n. gen. n. sp.

1. Longitudinal section through two segments. (U-4507/1) \times 30.
Uzdužni presjek kroz dva segmenta.
2. Longitudinal-oblique section. (U-63/3) \times 33.
Uzdužno-kosi presjek.
- 3-6. Transversal, somewhat oblique section. (Br.-8b/5; U-330/5; Br.-8b/7; Br.-8b/6)
 \times 33.
Poprečni, malo kosi presjeci.
7. Tangential section. (U-4507/1) \times 33
Tangencijalni presjek.

Foto: V. Matz

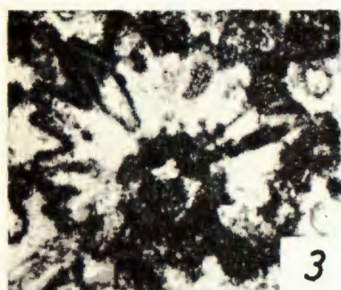
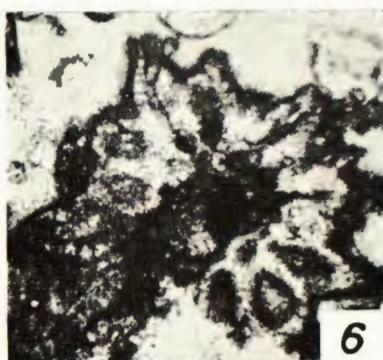
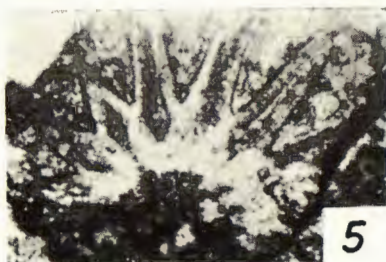


PLATE - TABLA IV

1-8. *Likanella spinosa* n. gen. n. sp.

1. Longitudinal section. (U-330/5) \times 33.
Uzdužni presjek.
2. Transversal, somewhat oblique section. (U-330/4) \times 33.
Poprečni, malo kosi presjek.
3. Transversal section. (U-330/5) \times 33.
Poprečni presjek.
4. Tangential section with fine porous walls of branches. (Br.-8b/3) \times 34.
Tangencijalni presjek s fino poroznim stijenkama ogranaka.
5. Transversal section. (U-330/3) \times 33.
Poprečni presjek.
6. Tangential section through two segments. (U-330/8) \times 30.
Tangencijalni presjek kroz dva segmenta.
7. Longitudinal section. (U-330/3) \times 33.
Uzdužni presjek.
8. Transversal, somewhat oblique section. (U-4012/3) \times 32.
Poprečni, malo kosi presjek.

Foto: V. Matz

