

Geol. vjesnik	29	173—179	2 plates	Zagreb, 1976
---------------	----	---------	----------	--------------

561.263:551.762(161.16.44)

BRANKO SOKAČ and IVO VELIĆ

LINOPORELLA? *SVILAJENSIS* N. SP. (CALCAREOUS ALGAE;
DASYCLADACEAE) FROM THE UPPER JURASSIC? — LOWER
CRETACEOUS? LIMESTONE OF MT. SVILAJA,
SOUTHERN CROATIA (DALMATIA)

A dasyclad alga, which may probably be attributed to the genus *Linoporella*, and deriving from the limestones whose stratigraphic position cannot be defined with certainty within the time-span Upper Jurassic-Lower Cretaceous, is described and its generic attribution and stratigraphic position are discussed.

INTRODUCTION

The material concerning the new species of Dasycladaceae, described below, was collected in the field by our colleague V. Sikirica during the geological mapping of the area of Mt. Svilaja. We wish to express our thanks to V. Sikirica for delivering the material for publication to us.

PALEONTOLOGIC DESCRIPTION

Family Dasycladaceae

Tribe Linoporelleae

Genus *Linoporella* Steinmann, 1899

Linoporella? *svilajensis* n. sp.

Plates I—II

Origin of the name: after Mt. Svilaja, where this alga was found.

Type-locality: the crest called Mačkula, about 500 metres W of the elevation point 959, in Mt. Svilaja (southern Croatia, Dalmatia).

Age: The stratigraphic horizon cannot be defined with certainty. The algal-bearing samples — an intrasparruditic limestone — have been located in a tectonically strongly disturbed area, the adjacent areas being built up of Upper Jurassic and Lower Cretaceous deposits.

Holotype: oblique section in the slide No. S-4435/2, shown in Pl. I, fig. 3. The material is being stored at the Institute of Geology, Zagreb.

Diagnosis: Probably a *Linoporella*, with primary branches perpendicular to the longitudinal axis and showing a more or less pronounced inflation at the base. Distally they branch off into secondary branches, which are, in turn, clearly wider at their outer ends. Spores can sometimes be observed in the wider parts of both the primary and secondary branches.

Description: *Linoporella? svilajensis* n. sp. belongs to that group of calcareous algae (Dasycladaceae), which is characterized by a cylindrical skeleton of rather regular build. In the sections observed the skeleton is built up of recrystallized calcite, frequently opaque in appearance. The outer surface seems to be smooth, but quite frequently it is heavily worn, due to the destruction which progresses inwards along the outer rims of the widened pores of the secondary branches. The inner rim is sharp and clearly defined (Pl. I, figs. 3, 5; Pl. II, figs. 1—3), but in some specimens it is also corroded, which seems to depend on whether the basal inflation of the primary branch is more or less pronounced. As a rule, the main stem occupies somewhat less than half of the outer diameter.

As has been recognized in all other species assigned to this genus, this species is also characterized by clearly distinguishable primary and secondary branches. The primary branches are arranged in verticills and are approximately perpendicular to the longitudinal axis of the thallus, or only slightly inclined, thus forming a very small angle with the horizontal plane. The primary branches are particularly characteristic of this species, displaying at their base a globular, or somewhat deformed and irregular, swelling (Pl. I, figs. 3, 5; Pl. II, figs. 1, 4), which becomes narrower nearer the main stem, so that communication with it is performed through a tiny pore. At their distal part, the primary branches also become abruptly narrower, thus forming a tube-like handle before dividing into secondary branches. However, such a shape in the primary branches is often obscured by subsequent destruction, so that in the majority of cases they primary ones appear variously shaped, with over-pronounced swelling, or widened at the very part of contact with the main stem and then gradually becoming narrower going outwards, or similar.

The secondary branches branch off from the primary branch. They (probably 3—4) are somewhat longer than the primary branch, and at their base they diverge from each other. Going towards the periphery, they sometimes (in certain specimens) bend

towards each other. Since in horizontal and vertical sections, respectively, two secondary branches are often visible, they probably grow out in a fairly symmetrical way. In their lower part, the secondary branches are mostly of a uniform thickness, but nearing the outer surface they abruptly widen, thus being reminiscent of a stemmed wine-glass (Pl. I, figs. 2, 3).

Sometimes, but not frequently, spores can be observed in both the basal swelling of the primary branches and in the wineglass-shaped distal widenings of the secondary branches.

Dimensions in mm:

Outer diameter	2.03—2.78
Inner diameter	0.73—1.18
Length of primary branches	0.25—0.37
Length of secondary branches	0.37—0.52
Diameter of basal widening in the primary branches	0.10—0.17
Distance between whorls	0.37—0.45
Number of branches in a whorl	28—35
Number of secondary branches	3—4
Diameter of spores	0.02—0.05

Similarities and differences: The attribution of the above described species to the genus *Linoporella* is suggested by several characteristic features, but it shows, at the same time, certain deviating features, which made us reluctant to attribute it definitely to the genus *Linoporella*, at least until new discoveries corroborate this attribution. The critical feature in this respect is the basal swelling in the primary branches, which must be regarded as a new characteristic, affecting the otherwise typically *Linoporella*-shaped branches. In *Linoporella*, our knowledge as to the place where the formation of the spores took place was inadequate. Pia (1927) considered it likely that the spores were formed in the main stem, which indeed appears logical in all the species of *Linoporella* so far described, with regard to the shape and dimensions of their branches. However, as has been mentioned above, in our species spores can be recognized in both the basal swellings of the primary branches and in the widened peripheral parts of the secondary branches.

When compared to other already known species of the genus, *Linoporella?* *svilajensis* n. sp. shows some obvious differences. While by the dimensions of the calcareous skeleton it is similar to *L. kapelensis* Sokač & Nikler (1963), it differs both by the more or less horizontal position of the primary branches (in contrast to the rather steep one in *L. kapelensis*), as well as by its different values in some other measured elements. The new species

is bigger than *L. elliotti* Praturlon (1965), in addition to having the same difference as regards the position of the branches in relation to the longitudinal axis of the thallus. There are obvious differences in both the dimensions and the shape of the branches to *L. capriotica* (Oppenheim) (1889) and *L. taurica* Pčelincev (1925), as well as to the recently described *L. buseri* Radoičić (1975). It should be once again emphasized that the principal and most obvious difference in relation to all other species of the genus *Linoporella* lies in the existence of the basal swelling in the primary branches in *L. svilajensis* n. sp., though this feature does not seem to be equally pronounced in all branches of the same whorl.

Stratigraphic position: The new species has been found in the deposits attributed to the Upper Jurassic at neighbouring sites, owing to both lithological properties and fossil finds. However, the algal bearing sample itself has been lacking in any other characteristic fossil species, and this, as well as because of its being found in a tectonically strongly disturbed place, where Lower Cretaceous deposits also occur, prevents us ascribing this species to either stratigraphic horizon.

Received 30 March 1976

Institute of Geology,
Sachsova 2, 41000 Zagreb

REFERENCES

- Oppenheim, P. (1889): Beiträge zur Geologie der Insel Capri und der Halbinzel Sorrent. — Z. deutsch. geol. Ges., 41, 442–458, pl. 19–20, Berlin.
- Pčelincev, V. (1925): Hydrozoen und Dasycladaceen aus den mesozoischen Ablagerungen der Krim.—Trav. Soc. Nat. Leningrad, 55/4, Sect. Geol. Min., (refer. 85–86, pl. 2, fig. 5), Leningrad.
- Pia, J. (1927): Thallophyta: in Hirmer: Handbuch der Paleobotanik, I, München und Berlin.
- Praturlon, A. (1965): A new *Linoporella* (Dasycladaceae) from Middle Cretaceous of Marsica (central Apennines). — Geol. Rom., 4, 1–6, fig. 1–3, Roma.
- Radoičić, R. (1975): *Linoporella buseri* sp. nov. from the Liassic of the Julian Alps (a preliminary report). — Bull. sci. Cons. Acad. RSF Yougosl., (A), 20/9–10, fig. 1, Zagreb.
- Sokač, B. & Nikler, L. (1963): *Linoporella kapelensis* n. sp. (Dasycladaceae) from the Tithonian of Mt. Velika Kapela. — Geol. vjesnik, 25, 65–71, pl. 1–3, Zagreb.
- Steinmann, G. (1899): Über fossile Dasycladacen von Cerro Escamela, Mexico. — Bot. Ztg., 57, 137–154, 18 figs., Leipzig.

B. SOKAČ i I. VELIĆ

LINOPORELLA? SVILAJENSIS N. SP. (VAPNENAČKE ALGE;
DASYCLADACEAE) IZ GORNJOMALMSKIH ILI DONJOKREDNIH
VAPNENACA PLANINE SVILAJE

Materijal s ostacima ovdje opisane vapnenačke alge potječe s terena planine Svilaje. Prikupio ga je kolega V. Sikirića prilikom izrade geološke karte lista Sinj, pa mu za ustupljeni materijal i ovom prilikom zahvaljujemo.

PALEONTOLOŠKI OPIS

Familia Dasycladaceae

Tribus Linoporelleae

Genus *Linoporella* Steinmann, 1899

Linoporella? svilajensis n. sp.

Table I—II

Porijeklo imena: prema planini Svilaji, u masivu koje je ova alga nađena.

Tipični lokalitet: greben Mačkule oko 500 m zapadno od kote 959 u planini Svilaji.

Geološka starost: intrasparruditski vapnenac potječe iz tektonski razlomljenog terena, kojega u okolini lokaliteta izgrađuju naslage gornje jure i donje krede.

Holotip: kosi presjek u izbrusku S-4435/2 prikazan na tab. I, sl. 3.

Dijagnoza: Dasycladacea koja vjerojatno pripada rodu *Linoporella*, s primarnim ogranacima približno okomitim na uzdužnu os i više ili manje napuhanim u bazalnom dijelu. Distalno od njih se odvajaju sekundarni ogranaci, izrazito prošireni na vanjskom kraju. U proširenjima primarnih i sekundarnih ogranaka utvrđene su spore.

Opis: *Linoporella? svilajensis* n. sp. pripada vapnenačkim algama za koje je karakterističan prilično pravilan cilindričan skelet. U promatranim presjecima skelet izgrađuje rekristalizirani, redovito zamućeni kalcit. Vanjska površina čini se cjelovita, ali izrazitije trošna uslijed razaranja koje napreduje uz vanjske rubove proširenih pora sekundarnih ogranaka. Unutrašnji rub je cjelovit i često jasno ocrtan (tab. I, sl. 3, 5, tab. II, sl. 1, 2, 3), ali u pojedinim primjeraka također korodiran, što je, čini se, ovisno o većem ili manjem proširenju bazalnog dijela primarnog ogranka. Matična stanica zaprema redovito nešto manje od polovine ukupnog dijametra.

Kao i ostali dosada opisani predstavnici ovoga roda, i naša vrsta odlikuje se prisutnošću jasno odijeljenih primarnih i sekundarnih ogranaka. Primarni ogranaci smješteni su u proširenje s približno okomitim položajem na uzdužnu os talusa, ili su tek neznatno zakošeni, pa u odnosu na horizontalnu ravninu čine vrlo mali kut. Primarni ogranaci ove vrste odlikuju se u svom donjem dijelu blago napuhanim okruglastim ili ponešto deformiranim nejednolikim proširenjem (tab. I, sl. 3, 5, tab. II, sl. 1, 4), koje u smjeru matične stanice stanjuje, pa u nju ulaze malom porom. Distalno primarni ogranaci također naglo stanjuju u držak podjednake debljine sve do njihovog razdvajanja u sekundarne ogranke. Međutim, ovakav oblik primarnog ogran-

ka najčešće je narušen sekundarnim razaranjem pa se u većini slučajeva prezentira različitim oblikom, predimenzioniranim proširenjem, prividnim proširenjem od same baze i postupnim sužavanjem distalno ili slično.

Od primarnih ogranaka odvajaju se 3—4 sekundarna ogranaka nešto duža od primarnih, divergentna u bazi jedan prema drugom. Prema vani kod pojedinih primjeraka povijaju jedan prema drugom. S obzirom da su često vidljiva po dva ogranka u horizontalnoj odnosno vertikalnoj ravnini, stiče se dojam njihovog relativno simetričnog izrastanja. U donjem dijelu podjednake su debljine, a uz površinu preko kratkog i slabog proširenja naglo odebljavaju u oblik čaše (tab. I, sl. 2, 3).

Rijetke i teško uočljive spore smještene su na dva mjesta: u bazalnom proširenju primarnog ogranaka i u čaši nalik distalnom proširenju sekundarnih ogranaka.

Dimenzije u mm:

vanjski promjer	2,03—2,78
unutrašnji promjer	0,73—1,18
dužina primarnih ogranaka	0,25—0,37
promjer bazalnog proširenja primarnih ogranaka	0,10—0,17
dužina sekundarnih ogranaka	0,37—0,52
udaljenost pršljenova	0,37—0,45
broj ogranaka jednog pršljena	28—35
broj sekundarnih ogranaka	3—4
promjer spora	0,02—0,05

Sličnosti i razlike: Opisana vrsta s više karakteristika sugerira svoju pripadnost rodu *Linoporella*, ali pokazuje i neke nove značajke, što nas je navelo da njezino definitivno uvrštavanje u rod *Linoporella* ostavimo donekle otvorenim do daljnjih nalaza. Spornim se čini proširenje u bazalnom dijelu primarnog ogranaka, čime se formira jedna nova značajka u općem obliku ogranaka, inače karakterističnom za rod *Linoporella*. Naša dosadašnja saznanja o smještaju spora kod ovoga roda bila su nepotpuna. P i a (1927) kao vjerojatnije smatra da su spore smještene u matičnoj staniči, što se čini i logičnim kod dosad opisanih vrsta roda *Linoporella* s obzirom na oblik i dimenzije njihovih ogranaka. Međutim, kod naše vrste spore su utvrđene u bazalnom proširenju primarnih ogranaka kao i u distalnom proširenju sekundarnih ogranaka.

U usporedbi s dosada poznatim vrstama roda *Linoporella*, *Linoporella? svilajensis* n. sp. pokazuje više razlika. Dimenzijama vapnenačkog skeleta približava se vrsti *L. kapelensis* Sokač & Nikler (1963), uz izrazitije razlike nekih drugih mjerenih elemenata, kao i po naglašeno usmjerenim ogradnicama u *L. kapelensis*. Od vrste *L. elliotti* Praturlon (1965) naša vrsta je veća, uz također prisutnu razliku položaja ogranaka u odraslu na uzdužnu os talusa. Razlike su uočljive i prema vrstama *L. capriolica* (Openheim) (1889) i *L. taurica* Pčelincev (1925) u dimenzijama, kao i obliku ogranaka, što je vidljivo i prema nedavno opisanoj vrsti *L. buseri* Radoičić (1975). Da naglasimo: jasna razlika ovdje opisane vrste od svih ostalih predstavnika roda *Linoporella* očituje se u proširenju nižeg dijela primarnog ogranaka, za koje se čini da može i izostati kod pojedinih grana istog pršljena.

Stratigrafski položaj: Opisana vrsta potječe iz naslaga koje su na osnovi litoloških odlika i nalaza provodnih oblika na susjednim lokalitetima uvrštene u gornju juru. Međutim, nedostatak karakterističnih fosilnih ostataka u samom uzorku, kao i razlomljenost naslaga u terenu gdje se nailazi i na donju kredu, ne omogućuje da se ova vrsta i pouzdano uvrsti u gornju juru.

Primljeno 30. 03. 1976.

*Institut za geološka istraživanja,
Sachsova 2, 41000 Zagreb*

PLATE — TABLA I

1—5. *Linoporella? svilajensis* n. sp.

1. Oblique section (kosi presjek); S-4435/24, x 15.
2. Tangential section (tangencijalni presjek); S-4435, x 36.
3. Cross section (poprečni presjek); S-4435/2, x 15.
4. Longitudinal section (uzdužni presjek); S-4435/19, x 15.
5. Cross section (poprečni presjek); S-4435/14, x 14,5.

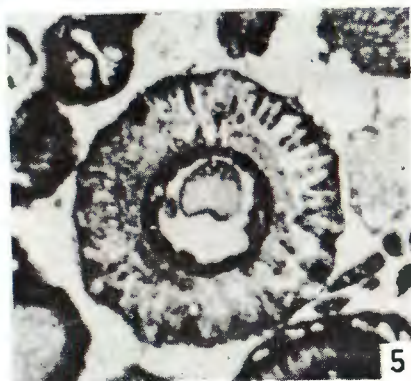
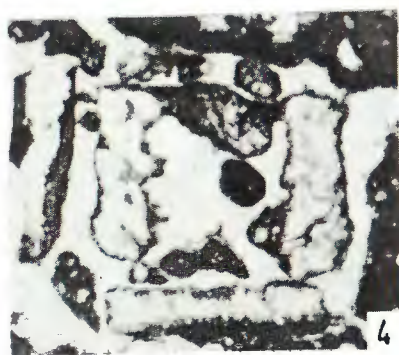
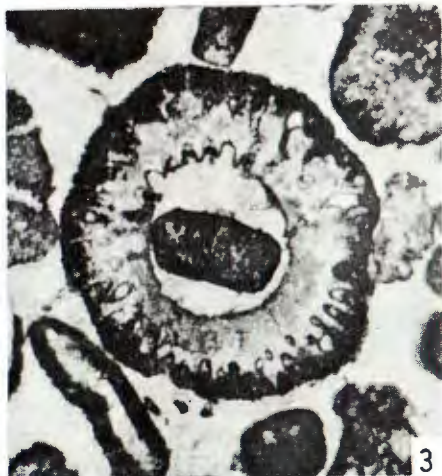


PLATE — TABLA II

1—6. *Linoporella? svilajensis* n. sp.

1. Cross section (poprečni presjek); S-4435/17, x 15.
2. Oblique section (kosi presjek); S-4435/14, x 15.
3. Oblique section (kosi presjek); S-4435/2, x 15.
4. Slightly oblique cross section (rnalo kosi poprečni presjek); S-4435/5, x 15.
5. Oblique section (kosi presjek); S-4435/1, x 15.
6. Cross section (poprečni presjek); S-4435/22, x 16.

