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TWO VARIETIES OF *TRIPLOPORELLA MARSICANA* PRATURLON,  
AND *TRIPLOPORELLA ISSAENSIS* N. SP. (CALCAREOUS ALGAE;  
DASYCLADACEAE) FROM THE LOWER CRETACEOUS OF THE  
ISLAND OF VIS (DALMATIA, SOUTHERN CROATIA)

The find of numerous, variously oriented sections, in a limestone sample from the Aptian-? Lower Albian of the island of Vis (in the Komiža bay) enabled us to make a distinction between two varieties of the species *Triploporella marsicana* Praturlon and the establishing of a new species, *Triploporella issaënsis* n. sp. The differences are based on the shape of the primary branches.

## INTRODUCTION

During the exploration of the igneous-clastic complex with anhydrites in the bay of Komiža, island of Vis, Lower Cretaceous deposits, in contact with the above mentioned rocks, have also been studied. In a sample of Lower Cretaceous limestone numerous microfossil remains, mostly foraminifers and variously oriented sections of calcareous algae, have been encountered. The list of the determined microfossils is as follows: *Triploporella marsicana* Praturlon (with two varieties), *T. issaënsis* n. sp., *Salpingoporella dinarica* Radoičić, *Coptocampylodon fontis* Patruilius, *Nezzazata simplex simplex* Omara, *Valvulammina picardi* Henson, *Pseudotextulariella? scarsellai* (De Castro), *Cuneolina* ex gr. *camposaurii-laurentii* Sartoni & Crescenti, *Nummuloculina heimi* Bonet, *Ovalveolina reicheli* De Castro, and *Sabadia* sp.

In addition to sections of *Triploporella marsicana* Praturlon (Dasycladaceae), sections belonging certainly to the genus *Triploporella*, but with differently shaped primary branches, have also been noticed. Considering the description of *T. marsicana* by Praturlon (1964), in which two populations are distinguished, the possibility of dividing that species into two varieties, along with the establishment of a new species, seemed necessary.

The available material seems, at first sight, identical to that of Praturlon (1964: p. 187, fig. 21), though it is difficult to make comparisons with the photomicrograph quoted producing frequent errors. Analyzing the available sections and in comparing them with the known species, certain new characteristics comprising of the two populations of *T. marsicana* became obvious. In the present authors' opinion, it appeared reasonable in accordance with some previous cases, to distinguish two varieties, that is: *Triploporella marsicana* var. *marsicana* (Praturlon) n. comb., and *Triploporella marsicana* Praturlon var. *adriatica* n. var. If this subdivision is accepted, sections designated by Praturlon (1964: p. 189, fig. 24) as the second population, in addition to our own sections figured earlier Sokač & Nikler, 1973: pl. IX, figs. 1-6; pl. X, figs. 2-4 have to be assigned to *T. marsicana* var. *marsicana*. To the second variety, *T. marsicana* Praturlon var. *adriatica*, those sections which show slightly different characteristics in the shape of the primary branches to the first variety, have been assigned in spite of almost identical basic structure, and are contained within the first population, represented by several specimens in the above-mentioned photomicrograph (Praturlon, 1964: p. 187, fig. 21).

In addition to that, sections of still another alga assigned to the genus *Triploporella* have been noticed, but differing from the known species of that genus in the structure and shape of the primary branches which caused us to distinguish it as *Triploporella issaënsis* n. sp.

The genus *Triploporella* has been the subject of several papers. It was recently discussed in sufficient detail by Sokač & Nikler (1973). Adding new species to that genus gradually enlarged the scope of the original diagnosis, so that now it should also include forms with slightly swollen proximal parts of the primary branches, followed by a narrowing and a thickening again at the distal end.

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#### PALEONTOLOGIC DESCRIPTIONS

Phylum Chlorophyta

Order Dasycladales

Family Dasycladaceae

Tribe Triploporelleae

Genus *Triploporella* Steinmann, 1880

*Triploporella marsicana* var. *marsicana* (Praturlon) n. comb.

1964. (pars). *Triploporella marsicana* Praturlon. — Praturlon, pp. 185—189, figs. 21 (pars), 23, 24.

1973. *Triploporella marsicana* Praturlon. — Sokač & Nikler; pp. 21—22, pl. IX, figs. 1—6; pl. X, figs. 2—4.

*Triploporella marsicana* var. *marsicana* (Praturlon) n. comb. corresponds partly to what has been described as the second population of *T. marsicana* Praturlon (1964), and partly to some sections of another material by Praturlon (1964: pp. 187-189, fig. 21 partim, figs. 22-24).

A more detailed description of that form, corresponding to what is now considered a detailed diagnosis of the variety *marsicana*, and accompanied by more numerous characteristic sections, has been given afterwards by Sokač & Nikler (1973: pp. 47-48, pl. IX, figs. 1-6; pl. X, figs. 2-4) under the name of *T. marsicana* Praturlon.

*Triploporella marsicana* Praturlon var. *adriatica* n. var.

Pl. I, figs. 1-6; pl. II, figs. 1-5a; pl. V, fig. 2.

1964. (pars). *Triploporella marsicana* Praturlon. — Praturlon, pp. 185-189, fig. 21.

Origin of the name: after the Adriatic sea.

Type locality: Komiza bay, island of Vis, below the road at Velo Žalo.

Type stratum: partly recrystallized biosparrudites; Aptian-Lower Albian.

Holotype: The oblique section in the slide KM-105/1, shown in Pl. I, fig. 1. Slides are stored in the Institute of Geology, Zagreb.

Diagnosis: A variety of *T. marsicana*, differing from the *T. marsicana* var. *marsicana* (= *T. marsicana* in Praturlon, 1964, and Sokač & Nikler, 1973) in that the comparatively tender primary branches are of a about the same thickness all along their length, or may have a more pronounced swelling at their distal end, similar to the vesiculi-ferous type of the branches. Spores are to be found singly or in groups of 3-5 pieces.

Description: The unsegmented cylindrical skeleton is built up of recrystallized yellowish calcite. The contours of the outer surface are sharply brought out, suggesting a smooth outer surface covered with tiny pores of the secondary branches. The inner surface of the skeleton, too, is smooth and plane, perforated with coarser pores of the primary branches through which the organic tissue of the main stem communicates with that in the primary branches. The inner cavity occupies about 50% of the whole diameter.

The *Triploporella*-type branches consist of primary and secondary ones. Primary branches are arranged in whorls (verticills), which are mostly in an alternating position, though this type of arrangement is not always clearly pronounced. Primary branches communicate with the main stem through a relatively large pore, in diameter approximately equalling the diameter of the primary branches along most of their

length. These are approximately of the same thickness all along their length, acquiring different shapes at their distal ends. In some specimens, the diameter of the distal end of the primary branches is all but equal to the remaining part of the branch, or only slightly swollen (Pl. I, figs. 1, 2, 4). In other specimens, however, the distal end of the primary branches is noticeably swollen, similar to the vesiculiferous type of the branches (Pl. I, fig. 3). Between these extremes there is a row of minor variations (Pl. I, fig. 5; Pl. II, fig. 2). The primary branches seem to be almost perpendicular to the longitudinal axis of the main stem, or very near to that position.

The secondary branches are short and distally widened. They grow out, independently from each other, from the distal end of the primary branch. There are most likely three secondary branches, as may be seen in the section shown in Pl. I, fig. 5. However, it is difficult to define, with certainty, the exact position of this section and hence show the real number of secondary branches. However, no more than three secondary branches have ever been noticed in various sections, which can be assigned either to this variety or to *T. issaënsis* n. sp. This suggests that at least a part of these sections actually belongs to this variety. Comparatively tiny spores are to be found in the primary branches.

Dimensions in mm:

Outer diameter	2.62—3.33
Inner diameter	1.40—1.67
Diameter of the primary branches	0.07—0.14
Length of the primary branches	0.78—0.96
Diameter of the secondary branches at their distal end	0.10—0.11
Distance between the whorls	0.22—0.25
Number of branches in a whorl	35—40
Number of secondary branches	3—4?
Diameter of the spores	0.02—0.03

Similarities and differences: *Triploporella marsicana* Praturlon var. *adriatica* n. var. shows essentially the same structural pattern, including the very similar shape of the branches, as *T. marsicana* Praturlon (1964). The distinguishing of the two varieties within the species *T. marsicana* is based upon specimens with maximally pronounced differences, which was partly stated already by Praturlon (1964), in distinguishing the two populations. *T. marsicana* var. *marsicana* unlike *T. marsicana* var. *adriatica*, has club-shaped primary branches which gradually and almost regularly slightly thicken, going right along from the funnelshaped end of the base, continuing into a short handle, up to the top. Only exceptionally a slightly swollen (inflated) distal end can be observed (Sokač & Nikler, 1973: pl. IX, figs.

2-4). In *T. marsicana* var. *adriatica* the primary branches are almost of the same thickness all along their length; some branches may be only slightly thickened (Pl. I, figs. 1, 2, 4), or, in some specimens, may be swollen distally (Pl. I, fig. 3). In the variety *marsicana*, the gradual thickening of the branches all along their length, as well as their large number in a whorl (35-50: Praturlon, 1964), frequently causes the branches to touch mutually (Praturlon, 1964: p. 189, fig. 24; Sokač & Nikler, 1973: pl. IX, figs. 2-4), unlike the variety *adriatica*, where the primary branches are distinctly set apart (Pl. I, figs. 1-6; Pl. II, figs. 2, 4, 5a). In *T. marsicana* var. *marsicana* the primary branches enter the main stem through a very tiny pore, resulting from the funnel-shaped narrowing of the base of the branch (Sokač & Nikler, 1973: pl. IX, figs. 3, 4). This is clearly different in the variety *adriatica*, where the branch enters the main stem through a large pore, of about the same diameter as the diameter of the branch itself (Pl. I, figs. 2, 3). In *T. marsicana* var. *marsicana* the alternating position of the branches in the neighbouring whorls, due to more numerous branches and their thickening, is more clearly expressed through the entire thickness of the calcite wall (Sokač & Nikler, 1973: pl. X, figs. 3-4), in contrast to *T. marsicana* var. *adriatica*, where such an arrangement is less clearly shown, going outwards. Probably, there is also a difference in the number of secondary branches: 4-5 in the variety *marsicana*, (Praturlon, 1964: p. 188, fig. 22; Sokač & Nikler, 1973: pl. X, fig. 4), and probably 3 in the variety *adriatica* (Pl. I, fig. 5). The spores also show a different arrangement and size. In *T. marsicana* var. *marsicana*, rather large spores are arranged in their primary position, in two rows alternately, in a longitudinally cut primary branch (Sokač & Nikler, 1973: pl. IX, fig. 4), whereas in the variety *adriatica* the spores are much smaller, individually scattered or sometimes grouped into groups of 3-5.

Considering alone the shape of the primary branches, there is a row of forms between the two varieties, which thus represent the two extremes of the same species, and it is difficult to define which variety they belong to. This is the case with the section shown in Pl. V, fig. 2, although all other characteristics point to the variety *adriatica*.

In some sections, the branches of *T. marsicana* var. *adriatica* considerably resemble those of the genus *Acroporella*, which, in the present authors' opinion, is now, with difficulty, distinguished from *Triploporella*, considering the recent emendation by Praturlon & Radoičić (1974). However, all the available forms certainly belong to the genus *Triploporella*, according to the existence of the intermediary forms between the two varieties.

**Stratigraphic position:** Rare finds of *Salpingoporella dinarica* Radoičić, as well as the foraminiferal association mentioned in the introductory part of this paper, indicate an Aptian-Lower Albian age.

*Triploporella issaënsis* n. sp.

Pl. II, fig. 5b; Pl. III, figs. 1-4; Pl. IV, figs. 1-5;  
Pl. V, figs. 1, 3, 4; Pl. VI, figs. 1-6

**Origin of the name:** The specific name derives from the old Greek name of the island of Vis (Issa).

**Type-locality:** island of Vis; Komiza bay, below the road northeast of Velo Zalo.

**Type-stratum:** Partly recrystallized biosparrudites; Aptian-? Lower Albian.

**Holotype:** Oblique section in the slide KM-101/1, shown in Pl. IV, fig. 1. The slides are stored at the Institute of Geology, Zagreb.

**Diagnosis:** Species of the genus *Triploporella* in which the primary branches are characterized by a swollen basal part, communicating with the main stem through a very short, thin handle, and thinning outwards rather abruptly into a handle which distally thickens again into a globular termination. Three secondary branches issue, separately from each other, from the globular termination of each primary branch.

**Description:** The calcareous alga has an unsegmented cylindrical calcareous skeleton, built up of fine-grained yellowish calcite. The outer surface appears smooth, pierced by the tiny pores of the secondary branches. The inner surface in the sections available is mostly destroyed and secondarily clogged with the calcitic tips pointing downwards (remains of the calcite wall of the branches) (Pl. III, figs. 1, 2). Because of the destroyed proximal part of the branches, the main stem is apparently larger, occupying up to 50-60% of the whole diameter. However, the real value, considering the true shape of the branches, would be, according to our interpretation, only about 30-35% of the whole diameter.

The *Triploporella*-type branches are arranged into whorls, probably alternating. Such arrangement cannot be clearly seen in the available sections; it would be probably more clearly expressed if the proximal part of the branches were preserved. The primary branches are situated obliquely in relation to the longitudinal axis of the main stem, forming an angle of 20-40°. The shape of the primary branches is what is characteristic of that species. The base part of the branch is swollen like a wineskin-bag and seems to communicate with the main stem through a very short thin handle and a tiny pore (Pl. V, figs. 3, 4). Going towards the periphery, the branch becomes thinner rather abruptly, forming a thin and elongated handle, which has a spherical swelling at its distal end. The thin central part of the branch bends downwards slightly, the terminal swelling also being sometimes downwardly drop-shaped, which emphasizes the general impression of the entire downward bending branch (Pl. III, fig. 1; Pl. IV, fig. 1). Such a shape of the primary branch

results in producing, in tangential and oblique-tangential sections, larger pores near the main stem (swollen part of base), much smaller pores in the central part of the calcareous wall (thin, middle, part of the branch), and larger pores, reappearing again, in sections cut near the surface of the calcareous skeleton (terminal swelling) (Pl. IV, figs. 1,5; PL. VI, fig. 1).

Each primary branch bears three (occasionally four?) short secondary branches, which are funnel-shaped, i. e. they widen distally considerably (Pl. VI, figs. 2, 3, 5; Pl. VI, fig. 4). The secondary branches grow out separately and independently from the terminal swelling of the primary branch.

Spores are seldom preserved; groups of 3-5 spores or individually scattered spores have been noticed in the swollen parts of the primary branches (Pl. VI, figs. 4, 6).

Dimensions in mm:

Outer diameter	2.59—3.70
Inner diameter	0.93—1.00
Maximum diameter of the primary branches in their proximal part	0.15—0.25
Diameter of the narrow middle part of the primary branches	0.07—0.10
Diameter of the terminal swelling of the primary branches	0.14—0.22
Length of the primary branches	0.85—1.00
Length of the secondary branches	0.15—0.18
Diameter of the distal part of the secondary branches	0.10
Distance between whorls	0.22—0.30
Number of branches in a whorl	30—35
Number of secondary branches	3—4?
Diameter of the spores	0.025—0.030

Similarities and differences: *Triploporella issaënsis* n. sp. show a rather distinct form of the primary branches, retaining the essential structural pattern of a *Triploporella*. No known species of *Triploporella*, described so far, show similarly shaped primary branches. The primary branches of *T. issaënsis*, by their proximal and terminal swellings and narrowed central part, clearly differ both from tubular, slightly widening branches in *T. marsicana* var. *marsicana* and from tubular branches, with a more or less distinct terminal swelling, in *T. marsicana* var. *adriatica*. As to the arrangement and dimensions of the spores, there is also an obvious difference between *T. issaënsis* and *T. marsicana* var. *marsicana*, whereas this feature is more similar to *T. marsicana* var. *adriatica*.

There are certain differences and similarities in some proportions, too, which is visible, if one compares the tables in the present paper

with those published by Praturlon (1964). The latter includes, also, the dimensional data for all other species of the genus *Triploporella*.

**Stratigraphic position:** Because of its joint occurrence with the previously described *T. marsicana* var. *adriatica*, *T. issaënsis* n. sp. has the same stratigraphic position, i. e. Aptian-?Lower Albian.

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#### DVA VARIJETETA VRSTE *TRIPLOPORELLA MARSICANA* PRATURLON I *TRIPLOPORELLA ISSAENSIS* N. SP. (VAPNENACKE ALGE; DASYCLADACEAE) IZ DONJE KREDE OTOKA VISA

#### UVOD

Prilikom istraživanja eruptivno-klastičnog kompleksa s anhidritima u uvali Komize na otoku Visu promatrane su i donjokredne naslage u kontaktu s prije spomenutim stijenama. U jednom od prikupljenih uzoraka donjokrednih vapnenaca utvrđeni su u većem broju mikrofosilni ostaci: foraminifere i različito orijentirani presjeci vapnenačkih alga. Analizom ovog materijala utvrđene su: *Triploporella marsicana* Praturlon s dva varijeteta, *T. issaënsis* n. sp., *Salpingoporella dinarica* Radoičić, *Coptocampylondon fontis Patrullius*, *Nezzazata simplex simplex* Omara, *Valvulammina picardi* Henson, *Pseudotextulariella? scarsellai* (De Castro), *Cuneolina* ex gr. *camposaurii-laurentii* Sartoni & Crescenti, *Nummoloculina heimi* Bonet, *Ovalveolina reicheli* De Castro i *Sabaudia* sp.

Uz presjeke koji pripadaju dasikladaceji *Triploporella marsicana* Praturlon prisutno je i više drugih presjeka koji nesumnjivo pripadaju rodu *Triploporella*, ali pokazuju neke razlike u obliku ogranaka prema do sada poznatim vrstama. Razmatrajući prikaz što ga je dao Praturlon (1964) prilikom opisa vrste *T. marsicana*, razlikujući dvije populacije, nametnula se mogućnost podjele te vrste u dva varijeteta, kao i mogućnost uspostavljanja jedne nove vrste u okviru ovog roda.

Materijal s kojim smo ovom prilikom raspolagali čini se identičnim Praturlonovom (1964, str. 187, sl. 21), premda je usporedba s navedenom fotografijom otežana i često uvjetuje greške. Analiza dobivenih presjeka i njih-



va usporedba s poznatim vrstama pokazala je postojanje nekih novih karakteristika unutar primjeraka obuhvaćenih vrstom *T. marsicana* u dvije populacije. To nam se činilo dovoljno, u skladu s uobičajenom praksom od nekih predhodnih slučajeva, da se razlikuju dva varijeteta: *Triploporella marsicana* var. *marsicana* (Praturlon) n. comb. i *Triploporella marsicana* Praturlon var. *adriatica* n. var. Prilikom ove podjele, varijetetu *marsicana* pribrojili smo presjeke označene od Praturlona kao druga populacija (Praturlon, 1964, str. 189, sl. 24), kao i presjeke prikazane ranije od nas (Sokač & Nikler, 1973, tab. IX, sl. 1-6; tab. X, sl. 2-4 kao *Triploporella marsicana*). Drugom varijetetu, *T. marsicana* Praturlon var. *adriatica*, pribrojenu su presjeci koji u odnosu prema prvom varijetetu, unatoč iste osnovne građe, pokazuju različito oblikovane ogranke i sadržani su u prvoj populaciji i prikazani pojedinim presjecima na skupnoj fotografiji (Praturlon, 1964, str. 187, sl. 21).

Uz ove, zapaženi su i presjeci još jedne dasikladaceje pribrojene rodu *Triploporella*, koja je usporedbom s poznatim vrstama pokazala razlike u građi primarnih ograna, što je i uvjetovalo da se izdvoji kao *Triploporella issaënsis* n. sp.

O rodu *Triploporella* pisano je u više prilika, a iscrpnije su ga ponovno prikazali Sokač & Nikler (1973). Doclavanjem novih vrsta postojećem rodu vrše se postupno i dopune dijagnozi, koja se i ovom prilikom proširuje, tako da uključuje i oblik ogranka s blago napuhanim proksimalnim krajem nakon kojeg dolazi do suženja i ponovnog odebljanja na distalnom kraju.

Zelja nam je i ovom prilikom zahvaliti kolegi I. Veliću na suradnji u terenskom radu i prikupljanju materijala. Također zahvaljujemo kolegi Z. Mikšiću na fotografiranju.

#### PALEONTOLOŠKI OPIS

Tribus Triploporelleae

Genus *Triploporella* Steinmann, 1880

*Triploporella marsicana* var. *marsicana* (Praturlon) Sokač & Nikler, n. comb.

1964 (pars). *Triploporella marsicana* Praturlon — Praturlon, str. 185—189, sl. 21 (pars), 23, 24.

1973 *Triploporella marsicana* Praturlon — Sokač & Nikler, str. 21—22, Tab. IX, sl. 1—6, tab. X, sl. 2—4.

*Triploporella marsicana* var. *marsicana* (Praturlon) nov. comb. prikazana je dijelom kroz opis vrste *T. marsicana* Praturlon kao druga populacija, a dijelom je predstavljena i s pojedinim presjecima iz drugog materijala od Praturlona (1964, str. 187—189, sl. 21 dijelom, sl. 22—24).

S nešto iscrpnijim opisom, koji odgovara opisu varijeteta *marsicana*, i s više karakterističnih presjeka, ovaj varijetet je prikazan kao vrsta *T. marsicana* Praturlon (Sokač & Nikler 1973, str. 47—48, tab. IX, sl. 1—6; tab. X, sl. 2—4).

*Triploporella marsicana* Praturlon var. *adriatica* n. var.

Tab. I, sl. 1—6; tab. II, sl. 1—5a; tab. V, sl. 2

1964 (pars). *Triploporella marsicana* Praturlon — Praturlon str. 185—189, sl. 21.

**Porijeklo imena:** Naziv varijeteta vezan je za Jadransko more, s obzirom da materijal potječe s otoka Visa koji leži daleko u ovom moru.

**Tipični lokaliteti:** otok Vis; u uvali Komize ispod ceste sjeveroistočno od Velo žalo.

**Tipični slojevi:** dijelom reskristalizirani biosparruditi; apt—? donji alb.

**Holotip:** Kosi presjek u izbrusku KM-105/1, prikazan na tab. I, sl. 1. Izbrusci se čuvaju u Institutu za geološka istraživanja, Zagreb.

**Dijagnoza:** Varijetet vrste *T. marsicana* koji se od nominalnog varijeteta razlikuje po tome što su primarni ogranci relativno nježe građe i približno podjednake debljine cijelom dužinom, ili, kod pojedinih primjeraka, s izrazitijim distalnim odebljanjem pa su tada nalik vezikulifernom tipu ogranka. Spore se nalaze pojedinačno ili u grupama od 3—5.

**Opis:** Cjeloviti cilindrični skelet izgrađen je od rekristaliziranog žućkastog kalcita. Konture vanjske površine ocrtavaju se u preparatu oštro, što sugerira glatku vanjsku površinu pokrivenu sitnim porama sekundarnih ogranka. Unutarnja površina skeleta također je glatka i ravna, s prišljenasto postavljenim krupnijim porama kroz koje se organsko tkivo matične stanice nastavlja u primarne ogranke. Unutarnja šupljina zaprema oko 50% ukupnog promjera.

Ogranci triploporelskih karakteristika sastoji se od primarnih i sekundarnih, od kojih su primarni smješteni u pršljenove i to tako da se ogranci susjednih pršljenova nalaze u alternirajućem rasporedu, ma da to nije uvijek jasno izraženo. Primarni ogranci kod *T. marsicana* Praturlon var. *adriatica* odvajaju se iz matične stanice razmjerno krupnim primjeraka, koje dimenzijom približno odgovaraju promjeru primarnih ogranka na najvećem dijelu njihove dužine. Ovi ogranci gotovo su podjednake debljine na cijeloj dužini, a na distalnom kraju poprimaju različit oblik. Kod pojedinih primjeraka, promjer primarnih ogranka u distalnom kraju gotovo je jednak promjeru ostalog dijela ogranka, koji neznatno prema vani postupno odebljava (tab. I, sl. 1, 2, 4). U nekih drugih primjeraka distalni kraj primarnih ogranka naglašeno je odebljao, pa se tim dijelom približava vezikulifernom obliku ogranka (tab. I, sl. 3). Između ova dva krajnja oblika moguć je niz manjih varijacija (tab. I, sl. 5; tab. II, sl. 2). Primarni ogranci izgleda da su gotovo okomiti ili vrlo blizu tom položaju u odnosu na uzdužnu os matične stanice.

Kratki i distalno slabo prošireni sekundarni ogranci izrastaju odvojeno iz distalnog kraja primarnog ogranka. Broj sekundarnih ogranka najvjerojatnije iznosi tri, što se nazire u presjeku (tab. I, sl. 5), ali je potrebno napomenuti da je definiranje pripadnosti takvog presjeka uza samu površinu skeleta veoma otežano. Međutim, u prilog prisutnosti tri sekundarna ogranka stoji činjenica da kod presjeka koji mogu odgovarati ovom varijetetu, ili novoj vrsti *T. issaënsis*, nije zapažen veći broj sekundarnih ogranka. Ovo nam sugerira da barem jedan dio ovih presjeka potječe od ovog varijeteta. Relativno sitne spore nalaze se u primarnim ograncima.

#### Dimenzije u mm:

vanjski promjer	2,26—3,33
unutarnji promjer	1,41—1,67
promjer primarnih ogranka	0,07—0,14
dužina primarnih ogranka	0,78—0,96
dužina sekundarnih ogranka	0,11—0,15
promjer sekundarnih ogranka na distalnom kraju	0,10—0,11
udaljenost pršljena	0,22—0,25
broj ogranka u pršljenu	35—40
broj sekundarnih ogranka	3—24
promjer spora	0,02—0,03

Sličnosti i razlike: *Triploporella marsicana* Praturlon var. *adriatica* n. var. u osnovi pokazuje istovjetnu građu, a generalno i veoma sličan oblik ogranaka, kao i vrsta *T. marsicana* Praturlon (Praturlon, 1964). Izdvajanje dva varijeteta u okviru vrste *T. marsicana* osniva se na primjercima s maksimalno izraženim razlikama, što je donekle izrazio i Praturlon (1964), razlikujući dvije populacije. *T. marsicana* var. *marsicana* u odnosu na *T. marsicana* var. *adriatica*, ima primarne ogranke kijačastog oblika, koji od ljevkastog završetka baze, na koji se još nastavlja kratki držak, pa sve do vrha, postupno i gotovo pravilno lagano odebljavaju i tek u iznimnim slučajevima pokazuju neznatnu napuhanost distalnog kraja (Sokač & Nikler, 1973, tab. IX, sl. 2—4). Kod *T. marsicana* var. *adriatica*, primarni su ogranci približno podjednake promjera na cijeloj dužini, s neznatnim odebljavanjem samo pojedinih ogranaka (tab. I, sl. 1, 2, 4), dok u nekih primjeraka distalno naglašeno odebljavaju (tab. I, sl. 3). Odebljavanje ogranaka cijelom dužinom kod varijeteta *marsicana*, za razliku od ogranaka kod varijeteta *adriatica*, uvjetuje, kao i povećani broj ogranaka (35—50 u pršljenu; Praturlon 1964), često njihov međusobni kontakt (Praturlon, 1964, str. 189, sl. 24; Sokač & Nikler, 1973, tab. IX, sl. 2—4), dok su kod varijeteta *adriatica* primarni ogranci međusobno jasno udaljeni (tab. I, sl. 1—6; tab. II, 2, 4, 5a). Primarni ogranak kod *T. marsicana* var. *marsicana* ulazi u matičnu stanicu suzjujući se ljevkasto u svojoj bazi kroz poru znatno manjih dimenzija od promjera ogranaka (Sokač & Nikler, 1973, tab. IX, sl. 3, 4), što je bitno različito od drugog varijeteta (var. *adriatica*), kod kojeg ogranak komunicira s matičnom stanicom porom jednakog promjera kao što je i njegov ostali dio (tab. I, sl. 1, 2). Kod *T. Marsicana* var. *marsicana* alternirajući položaj ogranaka susjednih pršljena, zbog većeg broja ogranaka i njihovog odebljavanja, potpunije je izražen kroz cijelu debljinu kalcitne stijenke (Sokač & Nikler, 1973, tab. X, sl. 3—4), nego što je to kod varijeteta *adriatica*, gdje se takav raspored udaljavanjem od baze postupno narušava. Razlika, ma da se to ne može sa sigurnošću tvrditi, vjerojatno postoji i u broju sekundarnih ogranaka, kojih je 4—5 kod varijeteta *marsicana* (Praturlon, 1964, str. 188, sl. 22; Sokač & Nikler, 1973, tab. X, sl. 4), a vjerojatno 3 kod varijeteta *adriatica* (tab. I, sl. 5). Razlika se uočava i kod rasporeda spora i njihove veličine. Kod *T. marsicana* var. *marsicana*, u primarnom položaju krupne spore u uzdužnom presjeku ogranaka snježstene su u dva reda naizmjenično (Sokač & Nikler, 1973, tab. IX, sl. 4), a znatno sitnije spore, pojedinačno ili ponegdje grupirane u nakupine od 3—5, zapažaju se kod varijeteta *adriatica*.

Između ova dva varijeteta, koji, kako se to sada čini, predstavljaju krajnje oblike iste vrste, postoji niz oblika za koje je, ako se gledaju samo primarni ogranci, teško definirati da li ih priključiti jednom ili drugom varijetetu, kao što je to slučaj s presjekom prikazanim na tab. V, sl. 2, iako svi drugi prije spomenuti elementi definiraju njegovu pripadnost varijetetu *adriatica*.

Ogranci u pojedinih presjeka *T. marsicana* var. *adriatica* znatno se približavaju izgledu ogranaka roda *Acroporella*, koji se prema našem mišljenju, s novom dopunom (Praturlon & Radoičić, 1974) teško mogu razlikovati od triploporelskih. Međutim, na osnovi prelaznih oblika između jedne i druge varijacije pripadnost svih ovdje prikazanih primjeraka rodu *Triploporella* je nesumnjiva.

Stratigrafski položaj: Na ternelju veoma rijetkih nalaza vrste *Salpingoporella dinarica* Radoičić i foraminifera navedenih u uvodnom dijelu, može se zaključiti na stratigrafski položaj s rasponom apt-donji alb.

*Triploporella issaënsis* n. sp.

Tab. II, sl. 5b; tab. III, sl. 1-4; tab. IV, sl. 1-5; tab. V, sl. 1, 3, 4; tab. VI, sl. 1-6.

Porijeklo imena: ime vrste potječe od starog grčkog naziva za otok Vis (Issa).

Tipični slojevi: dijelom rekristalizirani biosparruditi; apt-?donji alb. istočno od Velo žalo.

Tipični slojevi: dijelom rekristalizirani biosparruditi; aps-?donji alb.

Holotip: kosi presjek u izbrusku KM-101/1, prikazan na tab. IV, sl. 1. Izbrusci se čuvaju u Institutu za geološka istraživanja, Zagreb.

Dijagnoza: Vrsta roda *Triploporella*, kod koje se primarni ogranaci odlikuju mješinsto napuhanom bazom, koja se vrlo kratkom i tankom drškom povezuje s matičnom stanicom, dok se prema vanjskom kraju dosta naglo stanjuje u držak koji distalno ponovno odebljava u formu glavice. Iz svakog distalnog odebljanja primarnog ogranaka odvojeno izrastaju tri sekundarna ogranaka, proširena na vanjskom kraju.

Opis: Vapnenačka alga cjelovitog je cilindričnog skeleta, kojeg izgrađuje sitnozrnati žućkasti kalcit. Vanjska površina čini se glatka i pokrivena je sitnim porama sekundarnim ogranaka. Unutarnja površina u presjecima redovito je dobrim dijelom razorena i sekundarno nazubljena, sa šiljcima (ostaci kalcitne stijenke ogranaka) okrenutim prema dolje (tab. III, sl. 1, 2). Uslijed razaranja mješinstog proksimalnog kraja ogranaka, matična stanica prividno je većih dimenzija i zaprema 50—60% ukupnog promjera, dok bi prava vrijednost, prema interpretaciji i stvarnom obliku ogranaka, iznosila samo 30—35% od ukupnog dijametra.

Ogranaci triploporelskih karakteristika smješteni su u pršljenove s mogućim alternirajućim rasporedom. Ovakav raspored tek se nazire u pojedinim presjecima, a vjerojatno je izražen samo u proksimalnoj regiji ogranaka. Primarni ogranaci stoje koso u odnosu na uzdužnu os matične stanice, s kojom zatvaraju kut od 20—40°. Oblik primarnih ogranaka karakterističan je za ovu vrstu. Bazalni dio ogranaka mješinsto je napuhnut, i, kako se čini, vrlo kratkim i tankim drškom i kroz poru malih dimenzija vezan je za matičnu stanicu (tab. V, sl. 3, 4). Nakon ovog bazalnog odebljanja ogranak se u središnjem dijelu dosta naglo vidljivo stanjuje, pa se poput izduženog drška nastavlja do ponovnog laganog odebljanja u obliku glavice na distalnom kraju. Suženi dio primarnog ogranaka, koji se nastavlja od proksimalnog mješinstog odebljanja, redovito lagano povija naniže, a često je i distalno odebljanje izrazitije izvučeno prema dolje, što naglašava opći dojam povijanja cijelog ogranaka prema dolje (tab. III, sl. 1; tab. IV, sl. 1). Takav oblik primarnog ogranaka predstavlja nam se kroz koso-tangencijalni ili kosi presjek porama većih dimenzija uz matičnu stanicu (bazalni mješinsti dio), znatno manjim dimenzijama pora kroz središnji dio vapnenačke stijenke (suženi dio ogranaka), i ponovo znatno većim porama (distalno odebljanje ogranaka) u presjeku blizu površine skeleta (tab. IV, sl. 1, 5; tab. VI, sl. 1).

Svaki primarni ogranak nosi tri, iznimno četiri, kratka i distalno naglašeno proširena sekundarna ogranaka (tab. VI, sl. 2, 3, 5; tab. IV, sl. 4). Sekundarni ogranaci rastu svaki za sebe iz distalnog odebljanja primarnog ogranaka.

Spore su rijetko sačuvane, a primijećene su u nakupinama od 3—5, ili pojedinačno u odebljanjima primarnih ogranaka (tab. VI, sl. 4, 6).

Sličnosti i razlike: *Triploporella issaënsis* n. sp. pokazuje drugačiji oblik primarnog ogranaka triploporelskih karakteristika, a koji se u odnosu na ogranke dosad poznatih vrsta ovog roda oštro razlikuje. Ogrankom odebljalim u bazi koji se u središnjem dijelu stanjuju i ponovo odebljava distalno, ogranaci *T. issaënsis* jasno se razlikuju od cjevastih ogranaka koji se prema vanjskom kraju šire kod *T. marsicana* var. *marsicana*, ili su približno podjed-

Dimenzije u mm:

vanjski promjer	2,59—3,70
unutarnji promjer	0,93—1,00
maksimalni promjer primarnih ogranaka u bazalnom dijelu	0,15—0,25
promjer suženog dijela primarnog ogranaka	0,07—0,10
promjer distalnog odebljanja primarnog ogranaka	0,14—0,22
dužina primarnih ogranaka	0,85—1,00
dužina sekundarnih ogranaka	0,15—0,18
promjer distalnog dijela sekundarnih ogranaka	0,10
udaljenost pršljena	0,22—0,30
broj ogranaka u pršljenu	30—35
broj sekundarnih ogranaka	3—74
promjer spora	0,025—0,030

nake debljine i s više ili manje naglašenim odebljanjem vanjskog kraja kod *T. marsicana* var. *adriatica*. Razlika između ove vrste i *T. marsicana* var. *marsicana* postoji i u načinu smještaja spora i njihovim dimenzijama, čirne se ova naša vrsta više približava i nalikuje na *T. marsicana* var. *adriatica*.

Sličnosti i razlike uočljivije su i kod pojedinih mjerenih elemenata, što je vidljivo usporedbom naših tabela i tabela koje je dao Praturion (1964), obuhvativši njima i ostale vrste roda *Triploporella*.

Stratigrafski položaj: S obzirom da je ova vapnenačka alga nađena u istom uzorku s prethodno prikazanom varijacijom *T. marsicana* var. *adriatica*, ima identičan stratigrafski položaj: apt-?donji alb.

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PLATE — TABLA I

- 1—6. *Triploporella marsicana* Praturlon var. *adriatica* nov. var.
1. Oblique section (kosi presjek); KM-101/5, x 11,1 (holotypus).
  2. Oblique section (kosi presjek); KM-101/7, x 13,5.
  3. Cross section (poprečni presjek); KM-101/12, x 14,6.
  4. Oblique section (kosi presjek); KM-101/3, x 11,1.
  5. Tangential section (tangencijalni presjek); KM-101/5, x 25,6.
  6. Transversal section (poprečni presjek); KM-101/4, x 13,5.

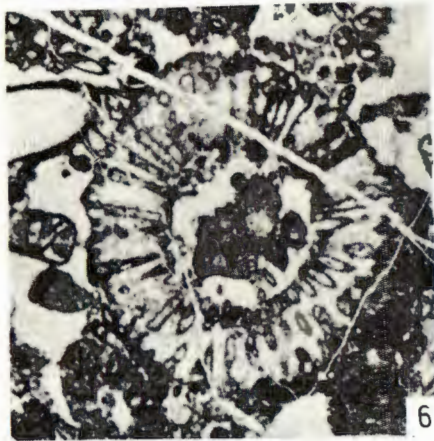
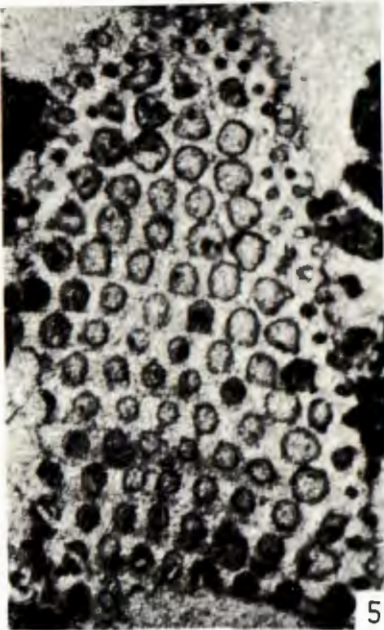
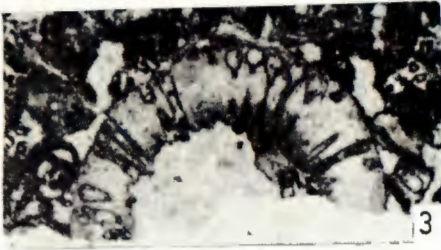
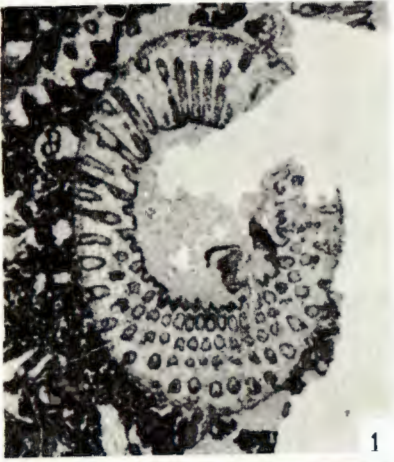


PLATE — TABLA II

- 1—5a. *Triploporella marsicana* Praturion var. *adriatica* nov. var.
1. Oblique section (kosi presjek); KM-101/1, x 11,3.
  2. Transversal section (kosi presjek); KM-101/21, x 12,7.
  3. Oblique section (kosi presjek); KM-101/14, x 17.
  4. Slightly oblique cross section (malo kosi poprečni presjek); KM-101/21, x 13,1.
  - 5a. Oblique section (kosi presjek); KM-101/5, x 11,8.
  - 5b. *Triploporella issaënsis* n. sp.  
Oblique section (kosi presjek); KM-101/5, x 11,8.



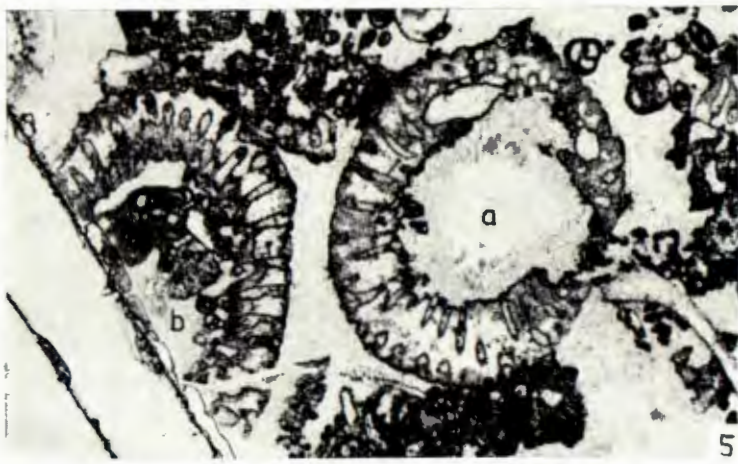
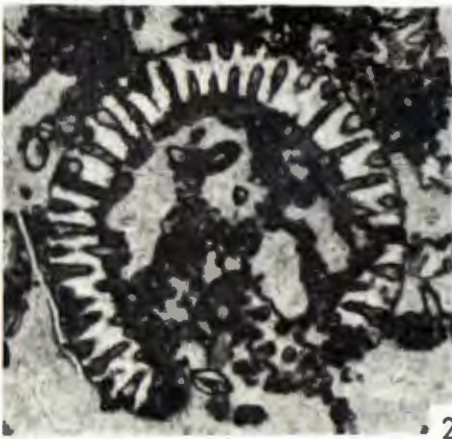


PLATE — TABLA III

1—4. *Triploporella issaënsis* n. sp.

1. Longitudinal section (uzdužni presjek); KM-101/21, x 14.
2. Slightly oblique longitudinal section (malo kosi uzdužni presjek); KM-101/1, x 14,6
3. Oblique section (kosi presjek); KM-101/21, x 12,4.
4. Oblique section (kosi presjek); KM-101/7, x 13,7.

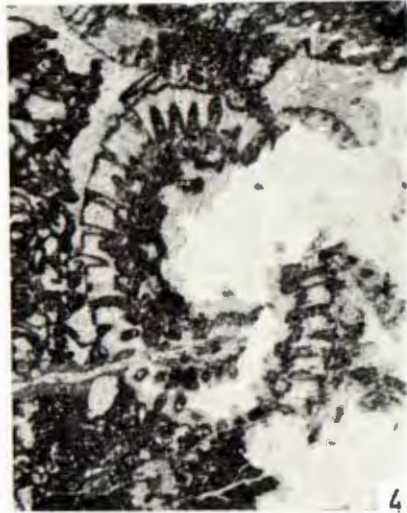


PLATE — TABLA IV

1—5. *Triploporela issaënsis* n. sp.

1. Oblique section (kosi presjek); KM-101/1, x 10,8.
2. Oblique section (kosi presjek); KM-101/8, x 12.
3. Oblique section (kosi presjek); KM-101/7, x 13,5.
4. Oblique section (kosi presjek); KM-101/5; x 12,5.
5. Oblique section (kosi presjek); KM-101/1, x 13,5.

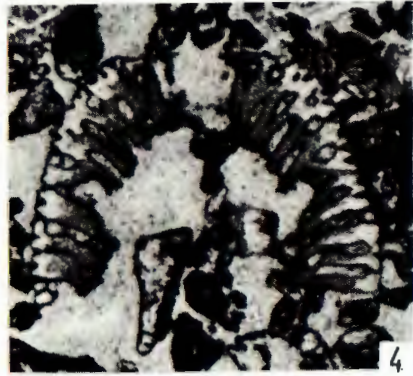


PLATE — TABLA V

1, 3, 4. *Triploporella issaënsis* n. sp.

1. Slightly oblique longitudinal section (malo kosi uzdužni presjek); PU-7845, x 19.
2. *Triploporella marsicana* Praturlon var. *adriatica*, n. var. (uzdužno-tangencijalni presjek); KM-101/6, x 11,3.
3. Longitudinalni section (uzdužni presjek); PU-7845, x 57,8.
4. Section through a branch (presjek kroz ogranak); KM-101/1, x 70,9.



PLATE — TABLA VI

1—6. *Triploporella issaënsis* n. sp.

1. Tangential section (tangencijalni presjek); KM-101/1, x 30.
2. Tangential section (tangencijalni presjek); KM-101/3, x 70.
3. Tangential section (tangencijalni presjek); KM-101/2, x 30.
4. Tangential section (tangencijalni presjek); KM-101/7, x 65.
5. Tangential section (tangencijalni presjek); KM-101/21, x 71,3.
6. Tangential section (tangencijalni presjek); KM-101/18, x 61,5.



