

## On some controversial Dasyclad genera and species and their stratigraphic position in the Lower Cretaceous deposits of the Dinarides

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Based on both the existing and the newly collected fossiliferous samples, revised descriptions of the genera *Korkyrella* and *Humiella* are presented. For *Korkyrella*, the emended description made possible to define its relationship with *Cylindroporella* and *Heteroporella*. *Korkyrella* differs from *Cylindroporella* and *Heteroporella* by the shape of the thallus and by the peculiar arrangement pattern of the ramifications in the fertile part of the thallus (= »head«), which corroborates its validity. For *Humiella*, its relationship with *Sarfatiella* and *Lagenoporella* is defined. While the existence of sterile and/or secondary ramifications distinguishes *Humiella* from *Sarfatiella*, that same feature makes *Humiella* identical with *Lagenoporella*, the latter thus becoming the younger synonym of *Humiella*. For *Humiella*-species, the stratigraphic position of *H. sardiniensis* in the Dinarides is discussed, *H. catenaeformis* is redescribed and the differences from *H. teutae* are established. One new species, *Humiella? pupnatensis* n. sp., is described.

Na osnovi postojećeg i naknadno obrađenog materijala dopunjene su karakteristike roda *Korkyrella*. Analiziran je odnos ovog roda prema rodovima *Cylindroporella* i *Heteroporella* od kojih se diferencira oblikom talusa i rasporedom ogranaka u fertilnom dijelu talusa čime se potvrđuje njegova validnost. Razmatran je odnos roda *Humiella* prema rodovima *Sarfatiella* i *Lagenoporella*. Dopunom odlika roda *Humiella* utvrđuje se njegova razlika prema rodu *Sarfatiella*, a poistovjećuje se s rodom *Lagenoporella* koji se time uvrštava u sinonimiju roda *Humiella*. U okviru roda *Humiella* razmatran je stratigrafski položaj vrste *H. sardiniensis* u Dinaridima, ponovljen je opis *H. catenaeformis* te je utvrđena njezina razlika prema *H. teutae*. Opisana je nova vrsta *Humiella? pupnatensis* n. sp.

### INTRODUCTION

In recent years several papers have been published containing descriptions of the new dasyclad genera and species which have provoked critical comments by some authors, with regard to both their taxonomic identity and their stratigraphic position. An analysis of these papers that are, based — frequently enough — on heterogeneous and variously preserved material, reveals the discrepancy of opinions and interpretations and even — though not frequently — an unnecessarily polemic tone. Though numerous other Mesozoic genera and/or species seem to be amenable to a similar kind of analysis, on this occasion I shall confine my observations to the genera *Korkyrella* and *Humiella* S o k a č

and Velić (1981 a, b), concentrating on their mutual relationship, the relationship of *Korkyrella* to *Cylindroporella* Johnson (1954) and *Heteroporella* Praturlon (1966; emend. Ott 1968), and the relationship of *Humiella* to *Sarfatiella* Conrad and Peybernès (1973) and *Lagenoporella* Ott and Flaviani (1983). The nature of this analysis necessitates also the inclusion into these observations of the species originally described as *Clypeina delmatarum* Sokač and Velić and *Coniporella piriformis* Sokač and Velić (1981b) and also of the form originally described as an incertae sedis — *Lacrymorphus catenaeformis* Radoičić (1967).

Soon after the publication of the genera *Korkyrella* and *Humiella*, Conrad (1982) published a critical comment arguing that the majority of sections designated *Korkyrella texana* (Sokač and Velić 1981a) belong to *Cylindroporella barnesii* Johnson, and that *Humiella teutae* (type-species of the genus *Humiella*) should be included in the genus *Sarfatiella*, thus proposing to invalidate both genera, *Korkyrella* and *Humiella*.

Ott and Flaviani (1983), while establishing the genus *Lagenoporella* also analyse the species *Clypeina delmatarum* Sokač and Velić and *Coniporella piriformis* Sokač and Velić concluding that the two species represent different part of the same plant belonging to their new genus *Lagenoporella*. Thus the new combination *Lagenoporella delmatarum* (Sokač and Velić), Ott and Flaviani has been proposed.

Recently, Masse et al. (1984), after analysing the species *Coniporella piriformis* Sokač and Velić (1981b), *Lacrymorphus catenaeformis* Radoičić (1967), and *L. barremianus* Dragastan (1971), come to the conclusion that the three species represent one and the same form, which is, moreover, identical with *Humiella teutae* Sokač and Velić. Based on a more complete observation of both the topotype material from the Dinarides and the material from the Murge (Italy), the authors have introduced the new combination *Humiella catenaeformis* (Radoičić) Masse, Acquaviva and Luperto Sinni, which includes all the above mentioned species. This procedure as well as the choosing of a neotype from the Italian material has already been criticized by Cherchi and Schroeder (1984).

This heterogeneity of opinions, combined with my own observations and with the necessity of nominating some forms associated with *Clypeina radici* Sokač, led me already at that occasion (Sokač 1986) to put forward my observations on the taxonomic assignment of some of the above mentioned forms and on their stratigraphic position in the Dinarides. As a continuation along the same line of research, a more detailed analysis of the forms concerned, accompanied by more abundant photographic documentation, will be put forward below. The newly collected material has made possible the clarification of some controversies and the revision of the taxonomic classification of some of the above mentioned dasyclads. Without the least to incite a polemics or to unduly favorize my own opinion, I feel justified in stating that each author bases his conclusions on his own observations of what and how he sees. Therefore, the possibility of making an error is im-

manent in that procedure and this will remain so also in the future. The errors are enhanced by the fact that we are often dealing with scarce and/or inadequately preserved material and by different ranking of the criteria we use, so that if an error is made, that does not mean its being made intentionally. Therefore the errors made by certain author (s) should not unduly be imputed to a »school«, as has been done by Conrad (1982) by accusing the school of Zagreb (and thus a wider circle of innocent workers) of disregarding »the elementary rules of exact typification and location of type-levels«. We obviously are using the same (or almost the same) criteria, but we are still far from a common conclusion as to which criteria are to be given the priority, this resulting in subjective considerations and conclusions. The subjective evaluation is (furthermore) enhanced by the unfortunate fact that frequently only scarce, fragmentary, and inadequately preserved sections are available. As to the second point made by Conrad (1982), i. e. that the »location of type-levels be respected in all cases«, it is not clear what is meant by that demand; if a type-level designated in an original description should be strictly respected, i. e. retained, then such a restrictive demand seems unjustified and unacceptable to me, the more so if the type-level is characterized by an undistinguished and undatable association. Of course this does not mean that the stratigraphic range of a species should be uncritically enlarged on the basis of problematic determinations. However, the restriction to the type-level would mean neglecting the possibilities of migration, environmental variations, changing of habitats, etc. The full vertical range of a species can not be established reliably unless it has been checked on a large number of distant localities and, if possible, in various depositional environments; this, however, does not exclude the possibility that a particular species in a particular region may have a more restricted range, characteristic of that particular area.

Analysis of the genus *Korkyrella* (Sokač and Velić 1981a)  
and of the Conrad's (1982) comments

The establishment of the genus *Korkyrella* (Sokač and Velić 1981a) was based on the material from the island of Korčula, of which a selection of sections have been published. Some of these could reasonably be identified with *Salpingoporella texana* Johnson (1965, p. 719—720, Pl. 89, figs. 5—9), while others only appeared similar to that species, that had been inadequately described and represented by poor material. Thus, by respecting the priority, the latter species was chosen as the type-species of the new genus. Today it is clear that the original description contained some incorrect interpretations, the fact that in addition to some similarities to the genus *Cylindroporella* — was considered to be a good reason for questioning the validity of *Korkyrella*. This was the approach taken by Conrad (1982) in his critical analysis, clearly stating that specimens described as *Korkyrella texana* are synonymous with *Cylindroporella barnesii* Johnson. Therefore, in order to definitely prove or disprove the validity of the genus *Korkyrella*, both the extant original material has been reanalysed and the new one collected, deriving from the stratigraphically identical levels

on the island of Mljet and in western Istria. The resulting observations which will be described below, will hopefully contribute to a more or less objective clarification of mistakes and misinterpretations made both in the original description of *Korkyrella* (Sokač and Velić 1981a) and in the critical comments by Conrad (1982).

In order to avoid future dilemmas and controversies, the basic pre-condition is to distinguish between: (a) what could belong to a particular genus — *Cylindroporella*, *Heteroporella*, or *Korkyrella*; (b) what is only similar to what; and (c) what is too poorly preserved, or the material (sections) available is too scanty, to make a correct determination possible. If we now look at the sections figured by Sokač and Velić (1981a, pls. I—III), it becomes clear that heterogeneous material has been lumped together under one specific name — *Korkyrella texana*. Thus, the sections figured in Sokač and Velić 1981a, Pl. II, figs. 1 and 11, clearly show the pores of the fertile ramifications («blisters», or «sporangia») arranged in both horizontal whorls and vertical rows, but in addition to that, also the pores of sterile ramifications which had originally escaped our attention. Moreover, in Pl. II, fig. 1 the transition of the upper, bulbous, part of the thallus («head») into the lower, narrower, one («stalk») is visible showing only the alternate arrangement of the sterile pores on the stalk. The arrangement of fertile ramifications in vertical and horizontal rows prevents us from assigning these sections to *Cylindroporella*. A group of sections — Pl. I, figs. 1, 2, 6 — shows a similar outward surface appearance, but their identity with the previous ones cannot be established with certainty. Sections in Pl. I, figs. 7, 9; Pl. II, figs. 5?, 14? and Pl. III, fig. 4?, indicate the alternating arrangement of the fertile ramifications, but we cannot tell whether also the sterile ones are present — this would make their assignment to *Cylindroporella* possible. The remaining sections — Pl. I, figs. 4—5; Pl. II, figs. 6, 7; and Pl. III, figs. 1—3, 5—9, — do not allow to be precisely defined, due to poor preservation, though some of them, as well as the previously mentioned ones, do possess sterile ramifications also in the bulbous part of the thallus — a fact that has been correctly observed by Conrad (1982). This fact alone, however, does not allow for their being unequivocally assigned to *Cylindroporella barnesii*, the more so as there are differences in the outline of the outer surface: it varies from an indented to a wavy one to a smooth one, or else suggesting prominent calcareous protrusions of the sterile ramifications (Sokač and Velić 1981a, Pl. I, fig. 8; and Pl. I, figs. 3, 5 in the present paper). It seems to me that these variations, taken together, are difficult to be explained as variations of the outer surface in one species in one stratigraphic level, being due only to different degree of preservation. A rather problematic (as to its value) tendency of lumping together of sections displaying visually different features can be seen also in Conrad (1982, Pl. I, figs. 1—9). In my opinion it is not very likely that, for instance, the section figured by Conrad (1982) in his Pl. I, fig. 1 can be assigned to the same form as the sections in figures 3, 7—9 on the same plate, in spite of their being differently cut and variously enlarged. The sections in Conrad (1982, Pl. I, figs. 4—6) as well as a large part of our original (Sokač and Velić

1981a) sections cannot be competently taken for a reliable species determination; they can, at the most, be taken as being indicative of, or suggesting, a possible assignment to, a definite species. If the section figured by Johnson (1954, Pl. 93, fig. 2) is being added (this section was refigured by Conrad 1982, Pl. 1, fig. 2, and was said by him to possibly belong to another species or even genus), then the lumping together of various remains into one species (*Cylindroporella barnesi*) can be traced as far back as to the original description by Johnson in 1954. Neither the sections figured by Peybernès and Conrad (1979, Pl. II, figs. 4—5) cannot be taken for reliable species determination of *C. barnesii*, and even less so their section on Pl. II, designated with a question-mark as *C. barnesii*. A number of sections figured by various authors and designated with cf., aff., etc. need not to be included into present considerations, for they show by their denomination alone that their authors were not free of dilemmas and uncertainties.

To conclude with, in the original description of *K. texana* (Sokač and Velić 1981a) several mistakes have been made: sections belonging to different forms have been lumped together, resulting in an overly simplified and inadequate description. Essentially the same mistake was made by Conrad (1982) in lumping together our material, except for a few sections of the »stalk«, in *C. barnesii*. He has, however, correctly recognized the existence of sterile ramifications in the bulbous part (»head«) of the thallus, which had been overlooked by us. However, the purpose of the present analysis is not to enumerate the mistakes made by previous authors (including our-selves) but to demonstrate individual approaches of the authors in the determination of the controversial sections, which for the most part only partly (except for the few ones that are unequivocal) are indicative of their generic attribution. This is even strengthened, of course neither the present analysis is free of such an individual approach, which seems inevitable when we are dealing with material of poor preservation, unclear inner morphology, and variable outer shape.

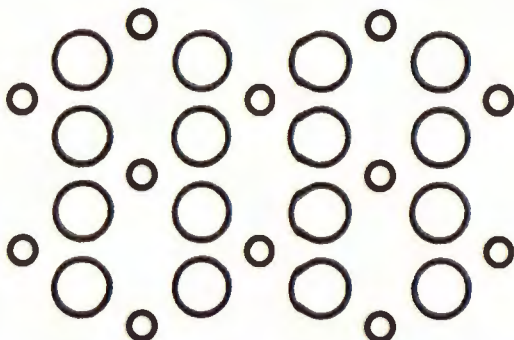
I hope that from both our original material and the newly collected material from the island of Mljet and western Istria section can be singled out which can be distinguished from both *Cylindroporella* and *Heteroporella*, thus enabling the reinstatement of *Korkyrella* based on the revised description, leaving aside the problematical *Salpingoporella texana* Johnson.

#### Reinstatement and reinterpretation of the genus *Korkyrella*

The calcareous skeleton of the genus *Korkyrella* is clearly differentiated into an upper bulbous (fertile) part (»head«) and a lower narrow tube (stalk). The transition between the two parts is fairly abrupt. The validity of the genus is based on the arrangement pattern of the fertile and sterile ramifications in the fertile part of the thallus. The fertile ramifications of the neighbouring whorls are situated one above the other thus forming both horizontal whorls and vertical rows. Sterile ramifications also are arranged into vertical and horizontal rows, but they alternate in both horizontal and vertical directions so that their

number (in both horizontal and vertical directions) is one half of the fertile ramifications (Text-fig. 1). On the stalk, only sterile ramifications are present.

By singling out of only some sections from the original material of *K. texana* — see the synonymy list below — a clear differentiation from the sections resembling *Salpingoporella texana* has been made. This done, the obligation of the priority with regard to the species name has ceased to exist and therefore the new name, *Korkyrella ivanovici*, is herewith introduced.



Text-fig. 1. Arrangement pattern of the fertile and sterile ramifications in the bulbous (fertile) part of the thallus (»head«) in *Korkyrella*

Sl. 1. Raspored fertilnih i sterilnih ogranaka u fertilnom dijelu talusa roda *Korkyrella*

*Korkyrella ivanovici* n. sp.

Pl. I; Pl. II, figs. 1—2, 4—6, 8

partim 1981a. *Korkyrella texana* (Johnson) — Sokač and Velić, p. 6—12; pl. I, figs. 2, 6, 8; pl. II, figs. 1, 6?, 11, 12.

**Origin of the name:** The species is dedicated to our colleague A. Ivanović, a long-year field companion.

**Type-locality:** the Korčula island, about 50 meters of the cross-road in the Brna village on the road for Prižba.

**Type stratum:** well-bedded, brown, partly recrystallized bio-intramicroite: top Barremian—Lower Aptian.

**Holotype:** longitudinal-oblique section figured in Sokač and Velić (1981a), Pl. II, fig. 1, re-figured here Pl. I, fig. 1, thin section Br.—3.

**Diagnosis:** For the time being, as for the genus, the genus being so far monospecific.

**Description:** The calcareous skeleton is built up of recrystallized calcite, having a distinct, upper, bulbous (fertile) part (= »head«) and a lower, narrower, stalk. The upper bulbous part has an elliptical

outline and passes rather abruptly into the cylindrical stalk of unknown length. In the interior of the bulbous fertile part a weakly calcified cylindrical continuation of the stalk (= »main stem«) may be supposed to exist, though the interior of the »head« in the available material is for the most part destroyed and filled up with dark micrite. The outer surface of the »head« appears irregularly indented, while it appears to be even and smooth along the stalk.

The bulbous »head« bears both fertile and sterile ramifications, while on the stalk only the sterile ones seem to be developed. The arrangement of the two kinds of ramifications in the »head« is the key characteristic of the genus and species (see the above discussion on the genus and Text-fig. 1). Some indications visible in the fertile part of the thallus (Pl. II, figs. 5—6) allow us to suppose that sterile ramifications distally split up into four prolongations. On the stalk, the sterile ramifications are arranged alternately, staying perpendicularly to the longitudinal axis and being of about the same diameter or showing a slight tendency to widen distally. On the stalk, there is no indication of the sterile ramifications being distally divided.

#### Dimensions in mm:

##### Dimensions of the »head«

Maximal length observed	2,6
Outer diameter	0,48—1,88
Inner diameter	0,12—0,19
Distance between sporangial whorls	0,10—0,16
Maximal diameter of sporangia	0,10
Number of sporangia in a whorl	10—14
Distance between whorls of sterile branches	0,09—0,14
Number of sterile branches in a whorl	5—7

##### Dimensions of the »stalk«

Maximal length observed	1
Outer diameter	0,19—0,35
Inner diameter	0,10—0,19
Distance between whorls of sterile branches	0,04—0,06
Number of sterile branches in a whorl	8—10

**Similarities and differences:** Poor state of preservation with destroyed inner morphology of the fertile part of the thallus, detached fertile and sterile parts of the thallus (i. e., »head« from stalk), as well as a roughly similar shape to some *Cylindroporella* species (and possibly also to some other genera) have made a reliable determination of this alga difficult, which often resulted in its uniting with *Cylindroporella*. As has already been explained in detail above, *Korkyrella ivanovici* n. sp. and the genus itself is distinguished by the characteristic arrangement of the two kinds of ramifications — the fertile and the sterile ones — in the fertile (bulbous) part of the thallus. This is also the main difference distinguishing *Korkyrella* from both *Cylindroporella* and *Heteroporella* (compare Text-fig. 1 in the present paper and the schematic drawing of the both latter species in Ott 1968, fig. 1). In addition, there is a difference in the thallus shape, or, more exactly, in the shape of the calcareous envelope, with regard to *Cylindroporella barnesii*, what *Korkyrella ivanovici* had most frequently been ascribed

to: *C. barnesii* consists of cylindrically shaped segments, tapered at both ends (Johnson 1954, Pl. 93, figs. 6—7), which strongly suggests their being originally linked to each other. As distinct from that, in *K. ivanovici* the available sections indicate a rather long cylindrical stalk (at any case longer than it may reasonably be assumed in *C. barnesii*) bearing at its top a bulbous »head«. However, when only stalks are available, there is no way of telling *K. ivanovici* from *C. barnesii* (except if, in the latter, the tapering at both ends is visible) or from still other species (or even general) having similar (or even not so similar) morphology. Therefore in such and similar cases (e. g., when fragments of »head« are available, but with — for whatever reason — indistinctly visible ramifications) the dilemma leading to possible misidentifications will still be present, the more so as different forms with similar (but not identical) characteristics are frequently present in the same level and even within the same sample. However, this does not invalidate the species — it only makes the determination questionable.

**Stratigraphic position:** At the type-locality, *K. ivanovici* has been found immediately below the first appearance of *Palorbitolina lenticularis* (Blumenbach) and associated with *Triploporella bacilliformis* Sokač, *T. marsicana* Praturlon, *Salpingoporella* sp. etc. Also, in western Istria and on the island of Mljet, *K. ivanovici* is presented at the same level but with a somewhat poorer microfossil association. Taken together, all these occurrences indicate the stratigraphic position of *K. ivanovici* as Upper Barremian and Lower Aptian.

Genus *Humiella* Sokač and Velić, 1981, emend.  
Masse et al. 1984.

The genus *Humiella* has been introduced with the species *H. teutae* Sokač and Velić. This description was not exhaustive: poor state of preservation and massive recrystallization of the calcareous envelope, that was, moreover, heavily abraded on the surface, have misled us to overlook the presence of tiny pores in both the calcareous envelope of the »main stem« (i. e., between the whorls of fertile ramifications) and of the fertile ramifications. The inadequacy of the description — which was mainly based on the outer shape of the thallus — caused the generic diagnose of *Humiella* to appear seemingly to the one of the genus *Sarfatiella*, which probably led Conrad (1982) to include *Humiella teutae* into the genus *Sarfatiella*. The same reasons, strengthened by our (Sokač and Velić 1981b) omission to mention the presence of tiny pores (corresponding to secondary ramifications on the »sporangia« and to sterile ramifications on the »main stem«, respectively) — which was obviously a failure — caused Ott and Flavianini (1983) to establish the genus *Lagenoporella* with *L. sardiniensis* as the type-species. Afterwards, a more complete analysis of the genus *Humiella* has been carried out by Masse et al. (1984), based partly on the topotype material and partly on the Monte Ricco (Murge, Southern Italy) material, resulting in the designation as *Humiella cate-naeformis* (Radoičić) Masse, Acquaviva and Luperto-Sinni, nov. comb. The observations of these authors, based mainly on the Murge material, confirmed the perforate character of the calca-



reous envelope of the sporangial ramifications (»ampullae«), which was also rightly pointed out to be (faintly) visible in the original material (Sokač and Velić 1981b, Pl. II, fig. 8). Therefrom the generic diagnosis of *Humiella* has been completed with reference to the perforated calcareous wall of the ampullae in addition to the previously defined characteristics. As for the mutual relationship of forms described as *Humiella teutae*, *Lacrymorphus catenaeformis* Radoičić, *L. barremianus* Dragastan, and *Coniporella piriformis* Sokač and Velić, Masse et al. (1984) are of the opinion that all these forms represent one species that they have chosen to name *Humiella catenaeformis* (Radoičić). This nomenclatorial emendation has been partly disputed and rejected by Cherchi and Schroeder (1984), for they point out that the perforate character of the ampullae wall has not been unequivocally demonstrated in the original material of *H. teutae*. Therefore the generic attribution of the Murge material to *Humiella* is considered by Cherchi and Schroeder (1984) to be doubtful and needing further studies. The same reasons have been accepted in the interpretation by Sokač (1986), resulting in the temporary acceptance of *Lagenoporella* which included the variously named forms showing whorls of ampullae with perforate wall. However, at the same time I have suggested (Sokač 1986), stimulated by the observations of Masse et al. (1984), the possibility that *Humiella teutae* may indeed possess a perforate calcareous envelope (both around the ampullae and the »main stem«), leaving the definite answer and thereby the taxonomic clarification to future studies. The present study aims to provide that answer. It is based on the material collected subsequently on the type-locality yielding additional thin sections and a few isolated, naturally eroded specimens. The perforate character of the calcareous envelope, both on the main stem (= between the whorls of the ramifications) and on the ramifications (= »ampullae«), has been confirmed (see below). Thus the emendation of *Humiella* in the sense of Masse et al. (1984) has to be accepted. However, this being the main feature distinguishing *Lagenoporella* from *Humiella* (see Ott and Flaviani 1983), the difference between *Lagenoporella* and *Humiella* becomes meaningless and consequently *Lagenoporella* should be regarded as a younger synonym of *Humiella* and hence be invalidated.

*Humiella teutae* Sokač and Velić 1981

Pl. III; Pl. IV, figs. 1—2, 4, 6

- ?1972. *Atopachara* sp. — Campobasso et al., pl. V, figs. 3—4.  
 1981. *Humiella teutae* n. sp. — Sokač and Velić, p. 101—105, pls. I—II.  
 1982. *Sarfatiella teutae* (Sokač and Velić) n. comb. — Conrad, p. 2.  
 ?1984. *Humiella catenaeformis* (Radoičić) n. comb. — Masse et al., p. 139—143 (partim), pl. I.  
 ?1984. *Humiella catenaeformis* (Radoičić) — Luperto Sinni and Masse, p. 340, pl. 37, fig. 2, pl. 39, figs. 2, 4.

In spite of the recent original description (Sokač and Velić 1981b), subsequent observations relevant for taxonomy by a number of

authors (see the above discussion on the genus) make an emended description necessary, the more so as it is the type-species of the genus.

The original statement of a »primarily or secondarily calcified thin cortical envelope enwrapping the soft part of the plant« (op. cit., p. 104) can now be corrected referring to frequent recrystallization of the calcareous skeleton indicated by a somewhat lighter zone of fine-grained calcite lining the inner surface (and sometimes also the outer one) of the dark line indicating the visible rims of the skeleton. One of the main characteristic features — the key for the definition of the genus — that was overlooked in the original description, is the existence of tiny pores in the calcareous envelope, both in the »main stem«, between the whorls of the fertile ramifications, and in the ampullae (»sporangia«) themselves. In the latter this is often preserved as a fine indentation. The existence of these pores has been pointed out by Masse et al. (1984) in the section figured by Sokač and Velić (1981b) in pl. II, fig. 8. A more careful observation reveals these (pores or the fine indentations respectively) to be present also in some other sections figured in the original description (e.g., in Pl. I, figs. 3 and 6, and in Pl. II, figs. 7—9), as well as in the sections figured here in Pl. III, Pl. IV, figs. 1—2, 4, 6.

The fact that these pores, or the finely denticulated surface, respectively, are only seldom visible is the consequence of a massive recrystallization that in that species has frequently obscured or destroyed these essential characteristic. Seldom, but nevertheless visible, in the calcareous envelope between the whorls all of these pores seem to be of about the same diameter (Pl. III, fig. 1—3), showing a slight tendency of widening at their outer end, which is, however, always affected by recrystallization and abrasion of the outer surface. Similarly, the pores in the ampullae envelopes seem to show a somewhat more pronounced distal widening. The arrangement of the pores cannot be seen but I suppose it to be probably aspondyle. The pores covering the surface between the ampullae whorls can be explained as sterile assimilatory hairs, whereas the ones covering the surface of the ampullae may be regarded as sort of secondary ramifications, their function being probably the same (= assimilatory sterile hairs). The same is true for other *Humiella* species.

Other characteristics have been given in the original description.

Similarities and differences: The emended description — as given above — makes *H. teutae* only remotely and superficially similar to the genus *Sarfatiella*. It differs from *Sarfatiella*, as well as from other similar genera, by having perforations (pores) in the calcareous envelope, both between and on the fertile branches (= ampullae, sporangia). As has already been mentioned above, this feature was thought to justify the establishing of *Lagenoporella* (Ott and Flaviani 1983), as it has been overlooked in the original description of *Humiella* (Sokač and Velić 1981b). Based on the same essential characters, four species, originally described under different names, are herewith included into *Humiella* and the fifth will be described below. These are: *H. teutae*, *H. sardiniensis*, *H. delmatarum*, *H. catenaeformis*, and *H. ? pupnatensis* n. sp. Their validity is based upon the species-specific differences, which make their distinguishing possible. *Humiella teutae* differs from *H. sardiniensis* by having the axial diameter about one

half of that in the latter, by a slightly wavy inner surface due to its slight infolding on the places where the fertile ramifications grow out, and — most evidently — by the number of fertile ramifications in a whorl, which is in *H. teutae* almost one half of that in *H. sardiniensis*. In spite of a generally similar shape of sporangial ramifications (ampullae) in both species (*H. teutae* and *H. sardiniensis*), a more detailed comparison shows the following differences: in *H. sardiniensis*, the ampullae are clearly differentiated into a comparatively long stalk and a swollen distal part, with a pronounced thickening at their junction. As distinct from that, in *H. teutae* the ampullae vary from pear-shaped, i.e. widening gradually from their very base (Sokač and Velić 1981b, pl. I, fig. 6, pl. II, figs. 7—8), to the ones having a clear but shorter stalk and a pronounced globular swelling but lacking the thickening at the junction (Sokač and Velić 1981b, Pl. I, fig. 5). Compared to *H. delmatarum* (the differences between *H. sardiniensis* and *H. delmatarum* have been given by Ott and Flaviani 1983), *H. teutae* shows a less wavy inner surface, smaller axial diameter, smaller distance between the whorls, and finer pores in both the wall of the »main stem« and of the proximal part of the ampullae (see the fragments of proximal parts of the ampullae in Sokač and Velić 1981c, pl. II, fig. 1) than *H. delmatarum*. The comparison of the fertile ramifications (ampullae) between *H. teutae* and *H. delmatarum* is not fully possible, because in *H. delmatarum* we lack the sections showing their connection with the »main stem«, this being even more complicated by the fact that separated »ampullae« which may probably be assigned to *H. catenaeformis* have been found in the same thin sections with *H. delmatarum*. Their common occurrence, as well as their being united into one species by Masse et al. (1984), makes the clear definition of the differences between them the so much more important. This will be put forward in the description of *H. catenaeformis* (see below).

*Humiella sardiniensis* (Ott and Flaviani, 1983) n. comb.

Pl. V—VI

1983. *Lagnoporella sardiniensis* n. gen., n. sp. — Ott and Flaviani, p. 18—21, figs. 2—4.

The original description (Ott and Flaviani 1983) is exhaustive enough making a new one superfluous, except for the fact that the sterile pores on the »stalk« (between the whorls of the fertile ramifications) are arranged in the aspondyle manner. The sections illustrated here (Pl. V., Pl. VI) represent additional illustrative documentation of that species, that has been found at several localities in the central and southeastern coastal belt of the Dinaric mountains.

The comparison of *H. sardiniensis* with other species belonging to this genus has been given in the original description or will be given below, where necessary.

**Stratigraphic position:** Because *H. sardiniensis* at its type-locality seems to occupy a somewhat higher (younger) stratigraphic position than in the Dinaric mountains, its stratigraphic position will

be discussed more extensively. According to the original description, that species has been found in several beds, associated with *Campbelliella striata* (Carozzi) (= zone with *Clypeina jurassica* and *C. striata*), and accordingly its stratigraphic position has been correctly established as Upper Jurassic. The present research, carried out in several uninterrupted and undisturbed Jurassic-Cretaceous sequences in order to establish the detailed litofacies and biofacies succession in that part of the Dinaric mountains, have shown a rather abundant occurrence of that species at several localities (Hercegovina, hinterland of Dubrovnik, Mt. Biokovo, Mljet island) and in a constant stratigraphic level. According to the observed succession and ranges of taxa and assemblages below, within, and above the layers with *H. sardiniensis*, that level may be attributed to the Berriasian; hence the range of *H. sardiniensis* must be enlarged. The level with *H. sardiniensis* — biomicrites, biointramicrites and biosparites about 20—30 m thick — is situated about 50—70 m above the last occurrences of *Campbelliella striata* and 25—80 m above *Clypeina jurassica* and *Salpingoporella grudii*, respectively, and about 15—40 m below the first appearance of *Pseudotextulariella salevensis* Charollais et al. and *Cuneolina tenuis* Velić and Gušić and the genus *Cuneolina* in general, and followed, somewhat higher, by *Epimastopora cekici* Radoičić and *Triploporella neocomiensis* Radoičić. The *H. sardiniensis*-bearing beds also contain *Salpingoporella katzeri*, *S. annulata*, *Clypeina radici*, *Clypeina* sp., *Humiella delmatarum*, *H. catenaeformis*, *Pseudoclypeina crnogorica* Radoičić, and a number of other and/or unidentified dasyclad remains. Therefrom it is concluded that *H. sardiniensis*, at least in that part of the Dinaric mountains, occurs in the Berriasian.

*Humiella delmatarum* (Sokač and Velić) n. comb.

Pl. IV, figs. 3, 5

1981c *Clypeina delmatarum* n. sp. — Sokač and Velić, p. 41—43, pl. II, figs. 1—6, pl. III, fig. 1.

partim 1983, *Lagenoporella delmatarum* (Sokač and Velić) n. comb. — Ott and Flaviani, p. 21—24, fig. 5 (left).

1986 *Lagenoporella?* *delmatarum* (Sokač and Velić) — Sokač, p. 53—54.

The remains of that species are only rarely found as larger pieces. They had originally been assigned to the genus *Clypeina*, the reasons for that being stated in the original description (Sokač and Velić 1981c). Later, while establishing the genus *Lagenoporella* Ott and Flaviani (1983) argued that both species described by Sokač and Velić (1981c), i.e. *Clypeina delmatarum* and *Coniporella piriformis*, represent one and the same form, in which the latter »species« represents but detached fertile ramifications of the former. The form resulting from such a combination has been named *Lagenoporella piriformis* (Sokač and Velić), by which occasion it was also pointed out that there are some difficulties in putting together the large bulbous fertile ramifications (»sporangia«) and the stalk, as the size of the »sporangia« exceeds the distance between the two consecutive whorls on the stalk.

However, this difficulty is said to be overcome if a »densely packed« alternate arrangement of the fertile »ampullae« is supposed. Masse et al. (1984) have the forms described by us (Sokač and Velić 1981c) as *Coniporella piriformis*, i.e. what has been regarded by Ott and Flaviani (1983) as fertile ramifications of *Lagenoporella delmatarum*, correctly recognized as *Lacrymorphus catenaeformis* Radoičić, originally described as *incertae sedis* (= genus *Lacrymorphus* Elliot; Radoičić 1967).

By splitting apart *H. delmatarum* (= *Clypeina delmatarum* = *Lagenoporella delmatarum*) from *H. catenaeformis* (= *Lacrymorphus catenaeformis* = *Coniporella piriformis*) and by putting the genus *Lagenoporella* into the synonymy of *Humiella*, the original description of *H. delmatarum* now appears inadequate.

Unfortunately, neither the newly undertaken analysis of the already existing material nor of the newly prepared thin-sections has yielded sections that would unequivocally show the complete thallus morphology, such as the central stalk with attached fertile ramifications (»ampullae«), so that some considerations still remain somewhat hypothetical. The main feature determining the generic attribution of that form to *Humiella* is not only the existence of sterile ramifications on the »main stem« between the fertile whorls (that is also the case with the genus *Clypeina*) but first of all the existence of such pores on, though rarely preserved, basal parts of the fertile ramifications stalks (Sokač and Velić 1981c, pl. II, figs. 1—2). Our present understanding of *H. catenaeformis* allows us to suppose its presence in the same thin-sections together with *H. delmatarum*. In that case, both the detached fertile ramifications (described originally as *Coniporella piriformis*) and some recrystallized longitudinal and oblique sections of a previously unidentified dasyclad characterized by somewhat thicker »main stem« wall, a narrower central cavity, an even inner surface and in which tiny aspondyle pores could be seen, can be attributed to *H. catenaeformis*. In these sections, no larger pores indicative of larger connections to fertile ramifications could be observed, which are, on the other hand, well distinguishable in *H. delmatarum* (Sokač and Velić 1981c, pl. II, figs. 2—3, pl. III, fig. 1). This supposition explains, firstly, the occurrence of a relatively large number of large detached pear-shaped (ampulla-like) ramifications (Sokač and Velić 1981c, pl. I), only a part of which can be with certainty ascribed to *H. catenaeformis* (due to recrystallization and poor state of preservation) (Pl. IV, fig. 7; Pl. VII, fig. 3; Pl. VIII), and, secondly, their larger size than what would in reality correspond to *C. delmatarum* (as mentioned also by Ott and Flaviani 1983). In describing *C. piriformis*, we choosed to show what we considered to represent larger and better preserved specimens; therefore *H. delmatarum* is likely to possess identically shaped but somewhat smaller ampullae, possibly also with less pronounced pores (perforations). The supposition of *H. delmatarum* having smaller ramifications agrees with other characteristics of that species: a much broader central cavity which moreover does not seem to be necessarily in all cases that wavy as it is the case in the holotype (Sokač and Velić 1981c, pl. II, fig. 1), and with a considerably thinner wall along the thallus. All

that makes the whole skeleton of that alga more fragile than in *H. catenaeformis* which, in turn, explains the invariably detached occurrence of the ampullae and the poor preservation of the »main stem« and makes smaller »ampullae« in *H. delmatarum* look more probable.

*Humiella catenaeformis* (Radoičić 1967) Masse et al. 1984

Pl. IV, fig. 7, Pls. VII—X

1967. *Lacrymorphus catenaeformis* n. sp. — Radoičić, p. 274—275, pls. I—II; pl. III, figs. 1—3.  
 non 1972. *Lacrymorphus catenaeformis* Radoičić, 1967 sardus n. subsp. Pecorini, p. 383, fig. 5a—m.  
 1981c *Contiporella piriformis* n. sp. — Sokač and Velić, p. 40—41, pl. I; pl. III, fig. 2.  
 partim 1983. *Lagenoporella delmatarum* (Sokač and Velić) n. comb. — Ott and Flaviani, p. 21—26, fig. 5 (right side).  
 non 1984. *Humiella catenaeformis* (Radoičić) n. comb. — Masse et al., p. 139—144, pl. I. (see synonymy list of *H. teutae*).  
 non 1984. *Humiella catenaeformis* (Radoičić). — Luperto Sinni and Masse, p. 340, pl. 37, fig. 2; pl. 39, figs. 2, 4. (see synonymy of *H. teutae*).  
 1986. *Lagenoporella catenaeformis* (Radoičić). — Sokač, p. 53—54. (not figured).

This form, known for a comparatively long time and variously taxonomically designated in the literature, has never been described properly; neither in the original description (Radoičić 1967), which was inadequate due to a small number of available sections and their poor state of preservation, nor in the later records. Later findings were also mostly represented by more or less recrystallized fragments of the fertile ramifications (= »ampullae«), detached from the main thallus stem, or, more rarely, by single sections of the whorls, all of which was insufficient to completely understand its morphology. The samples collected from the Lower Cretaceous deposits of the island of Mljet have yielded abundant and so far best preserved remains of that alga, that enable a more complete presentation of its characteristic features.

**Description:** The thallus of this alga consists of a calcareous cylindrical envelope, most frequently more or less recrystallized, bearing widely spaced whorls of completely individualized fertile ramifications. The central cavity occupies about 20% of the outer diameter, measured at the level of whorls, whereas between the whorls the amount is about 50%. This last value is prone to be corrected due to the destruction of the outer surface. The inner surface is pitted with the entrance pores of both the sterile and the fertile ramifications. Due to strong recrystallization, it appears in sections as a more or less sharp straight line (Pl. IX, fig. 1; Pl. X, figs. 3—4).

The fertile ramifications are pear-shaped (ampulla-like), well individualized all along their length (i.e., from their very beginning), and situated perpendicularly, to the central cavity. They alternate and due to their being strongly swollen their touch mutually and/or are even deformed, or, some among them cannot reach the full size (Pl. VII, fig. 3; Pl. VIII, figs. 1—2). The lack of visible pores of larger dimensions along

the inner surface and on the surface in tangential sections suggest that the fertile ramifications were connected with the »main stem« by very tiny pores, possibly just insignificantly larger, if at all, of the sterile ramification pores so that there is no way of telling the ampullae-bearing pores the »sterile« pores. Consequently, the ampullae stalks are strongly tapered at their bases, i.e. at their connections with the »main stem« (Pl. IV, fig. 7). The pores in the ampullae envelope, which are referred to as secondary ramifications, show a slight tendency of distal widening. The pores situated along the central »stem« between the whorls of fertile ramifications are referred to as sterile ramifications; they in no way differ from the »secondary« ramifications on the »ampullae«, are irregularly arranged (aspondyle), perpendicular or slightly oblique to the »main stem« and communicate with it through a tiny pore. They also show a slight distal widening. The sporadically gained impression of the secondary branches being still further split up (into the tertiaries) cannot be confirmed with certainty; therefore, the sporadically visible connection of the secondaries is interpreted as being due to secondary destruction. The arrangement of pores on the surface of the thallus is irregular-aspondyle (Pl. VII, fig. 2)

Dimensions in mm:

Maximal length observed	11,5
Outer diameter at the level with the fertile whorls	5,0—5,24
Outer diameter between the whorls	0,65—2,2
Inner diameter	0,23—1,2
Distance between the two consecutive fertile whorls	0,90—1,0
Length of the fertile ramifications (»ampullae«)	up to 2,4
Maximum diameter of the »ampullae«	up to 1,55
Number of fertile ramifications (»ampullae«) in a whorl	8—9

Similarities and differences: *Humiella catenaeformis* (Radoičić) has all characters typical of the genus: the shape of the thallus, the existence of sterile ramifications between the whorls of fertile ramifications, the ampulla-like shape of the fertile ramifications and their being completely individualized from their very base, the pores in the ampullae envelopes suggesting secondary ramifications. In spite of its general similarity, *H. catenaeformis* differs from the type-species, *H. teutae*, by its larger overall dimensions, more strongly pronounced perforations (i.e., by somewhat wider pores of the sterile and/or secondary ramifications), thicker and more coarsely perforated skeletal envelope both in the parts of the thallus between the whorls of the fertile ramifications and in the envelope of the fertile ramifications (»ampullae«). In addition, there is the essential and the most obvious difference: while in *H. teutae* there are two distinctly different pore types — the fertile ramifications (»ampullae«) communicate with the main stem by clearly distinguishable rather larger pores, their diameter being approximately equal to the inner diameter of the proximal part of the ampulla stalk (Sokač and Velić, 1981b, pl. I, figs. 1, 3, 5; pl. II, fig. 1), — in *H. catenaeformis* — as has been noticed in the above description — all pores are of about the same size. Therefore, even if thinner wall and smaller pores of the sterile/secondary ramifications in *H. teutae* could perhaps be explained as being due to secondary recrystalli-

zation and worn outer surface — as has been suggested by Masse et al. (1984; 141) for the obliteration of pores — there remains the essential difference: two distinct pore types in *H. teutae*, all pores being  $\pm$  equal in *H. catenaeformis*.

*H. catenaeformis* differs from *H. sardiniensis* by its larger size and thicker envelope, which is more coarsely perforated, by smaller number of the fertile ramifications in a whorl, and by their less clear connection with the »main stem«. In *H. sardiniensis*, the entrance pore of the fertile ramification is clearly visible, similarly as in *H. teutae* and *H. delmatarum*. With regard to *H. delmatarum*, the differences consist in a more or less wavy inner surface, larger inner diameter, thinner walls of the calcareous envelope, larger distance between two consecutive whorls, and possibly smaller fertile ramifications (»ampullae«) in *H. delmatarum* than in *H. catenaeformis*.

**Stratigraphic position:** According to the original description (Radoičić 1967), *H. catenaeformis* occurs, at the type locality, in the Lower Neocomian, i.e. in the beds that overlie the beds with »aberrant tintinnines« (= *Campbelliella striata*) which were then attributed to the Beriasian and consequently the position of *H. catenaeformis* was stated to be Valanginian. The same stratigraphic position was quoted by Radoičić (1967) for another locality, at the Njeguš Mountain, where *H. catenaeformis* occurs below the *Triploporella neocomiensis*-bearing beds. Its stratigraphic position in the Beriasian of the Biokovo Mountain has already been discussed earlier (Sokač and Velić 1981c) and, with more detail, in the preceding description of *H. sardiniensis*. All these localities belong to the same stratigraphic level, which may be firmly defined as Beriasian, due to both the underlying and the associated fossil associations. The forms figured by Masse et al. (1984) and Luperto Sinni and Masse (1984) cannot be assigned to *H. catenaeformis*, due to their thinner walls and distinct entrance pores of the »ampullae«, but are probably more similar to *H. teutae*. Neither *L. barremianus* Dragastan cannot be identified with *H. catenaeformis* but should be further on regarded as a problematical form. Therefore, the stratigraphic position of *H. catenaeformis* in the Dinaric Mountains may be firmly defined as Beriasian, while its occurrence in the younger deposits (Late Neocomian and the Barremian) remains not proved.

*Humiella? pupnatensis* n. sp.

Pls. XI—XII

**Origin of the name:** the species has been named after the Pupnat village on the Korčula island, where the type-locality is situated.

**Type-locality:** outcrops along the road about 2 km SW from the Pupnat village on the island of Korčula.

**Type strata:** biomicrites and recrystallized biointramicrites of the Upper Barremian.

**Holotype:** Oblique section in thin section KP-7, figured in Pl. XI fig. 1, stored at the Geološki zavod, Zagreb, collection B. Sokač.



**Diagnosis:** Tiny calcareous alga, having a cylindrical thallus bearing whorls of fertile ramifications spaced at regular intervals and alternating with 2—3 whorls of sterile ramifications. Fertile ramifications are horn-shaped and bear tiny secondaries at their distal parts.

**Description:** Tiny dasyclad alga, represented by a large number of variously oriented sections, displays a simple unbranched cylindrical thallus. The characteristic shape of the thallus is caused by the existence of two types of ramifications; the fertile ones are longer and horn-shaped and give the thallus the peculiar »spinose« appearance (Pl. XI, figs. 5—6, Pl. XII, fig. 1). The central cavity has smooth and sharply delineated boundaries and occupies most frequently about 20—30%, at the most 50% of the outer thallus diameter.

The two types of ramification are arranged in whorls along the thallus; they differ by shape and probably also by their function. The whorls of longer, horn-shaped ramifications alternate with regular intervals containing 2—3 whorls of smaller ramifications. The longer, probably fertile ramifications, are swollen in their proximal part and gradually tapering distally. At their outer (distal) parts, they bear secondary ramifications, which are, in the available material, seldom clearly visible (Pl. XI, fig. 1). Each fertile ramification has its own calcareous envelope; thus they are well individualized from their very bases though their envelopes (in the same whorl) may touch in their proximal part (approximately in the first 1/4 to 1/3 of their length), while more outwardly they are fully separated.

Ramifications of the other type are shorter, probably sterile and also arranged in whorls occupying the intervals between the longer (fertile), horn-shaped, ramifications. In each interval there are two to three whorls of sterile (shorter) ramifications (Pl. XI, figs. 2—3; Pl. XII, figs. 2—3). These ramifications slightly widen outwardly, are somewhat more flattened at their outer ends, and also possess their own calcareous envelopes (Pl. XI, figs. 2—3; Pl. XII, figs. 2—3, 7); that may or may not touch mutually. In extreme cases, these sterile ramifications are also fully individualized. In the consecutive whorls, the sterile ramifications are arranged alternately and have an elliptical shape in tangential sections, due to their being somewhat flattened. Thus in tangential sections they appear similar in shape to the fertile ramifications from which they are (in such sections) difficult to be distinguished.

Dimensions in mm:

Maximum observed length of thallus	2,90
Outer thallus diameter in the level of fertile whorls	0,48—0,95
Outer thallus diameter in the level between fertile whorls	0,25—0,43
Inner thallus diameter	0,12—0,22
Distance between fertile whorls	0,15—0,38
Distance between sterile whorls	0,10
Number of fertile ramifications in a whorl	7—9
Number of sterile ramifications in a whorl	7—9

**Similarities and differences:** Basic morphology of this alga — simple cylindrical thallus bearing intervals with 2—3 whorls of shorter, probably sterile, ramifications which alternate with whorls of

longer, probably fertile, ramifications having tiny secondaries at their outer parts — corresponds essentially to the genus *Humiella*. However, there are some differences from the other species attributed to that genus (which are described above). These are: (1) the shape of the fertile ramifications, that are horn-like in that species, as distinct from other species which have strongly swollen, ampulla-like fertile ramifications; (2) shape and arrangement of the sterile ramifications (which was the main reason for adding the question-mark to the generic attribution): in other *Humiella* species the sterile ramifications are tiny («thin»), with a slight tendency of distal widening, and of the aspondyle arrangement — this, however, being fully evident only in *H. catenaeformis* while it can reasonably be supposed to be the case also in other *Humiella* species. In contrast to that, in *H.? pupnatensis* sterile ramifications are arranged in alternating whorls (= euspondyle arrangement), and have their own calcareous envelopes. Because of the characteristics, parts of some sections of *H.? pupnatensis* show a certain similarity to *Clypeina somalica* Conrad et al.; the latter species, however, lacks two types of ramifications, so that the difference between the two species is clear, in spite of the same stratigraphic position.

**Stratigraphic position:** At the type-locality on the island of Korčula, *Humiella?* *pupnatensis* occurs in association with questionably determined algae *Salpingoporella* gr. *genevensis* (Conrad) and *S. gr. melitae* Radoičić, and with foraminifers which do not allow a more precise stratigraphic determination, such as *Nezzazata simplex* Omara, *Sabaudia minuta* (Hofker), *Debarina hahounerensis* Fourcade et al., *Pseudotextulariella?* *scarsellai* (De Castro) and others. More important, however, is the fact that *Palorbitolina lenticularis* (Blumenbach) appears not far above the *H.? pupnatensis*-bearing beds, which indicates their Barremian age. In another region, south of Hum (hinterland of Dubrovnik), the range of *H.? pupnatensis* extends from the Barremain up into the Lower Aptian, so that, for the time being, the total stratigraphic range of *H.? pupnatensis* may be defined as Upper Barremian-Lower Aptian.

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## O nekim spornim rodovima i vrstama dasikladacea i njihovom stratigrafskom položaju u naslagama donje krede Dinarida

B. Sokač

### UVOD

U nekoliko posljednjih godina objavljeno je više radova s opisima novih rodova i vrsta dasikladacea, koji su bili povodi kritičkog osvrta pojedinih autora kako u pogledu njihove taksonomske pripadnosti tako i u pogledu njihovog stratigrafskog položaja. Analizom ovih radova, često osnovanih na materijalu iz različitih područja i stratigrafskih nivoa te različitog stupnja očuvanosti, zapaža se različitost mišljenja i interpretacija pojedinih autora. a premda rijetko, i nepotrebno polemički naglasak. U ovoj prilici, premda je sličnom analizom moguće obuhvatiti i neke druge rodove i vrste iz različitih dijelova mezozoika, ograničit ću se na rodove *Korkyrella* i *Humiella* uspostavljene od Sokač & Velić (1981a, 1981b) te na njihov, odnos roda *Korkyrella* prema rodovima *Cylindroporella* (Johnson, 1954) i *Heteroporella* (Praturlon, 1966; emend. Ott, 1968), i roda *Humiella* prema rodovima *Sarfatiella* (Conrad & Peybernès, 1973) i *Lagenoporella* (Ott & Flaviani, 1983). U kontekstu razmatranja navedenih rodova neminovno je uključiti i vrste primarno opisane kao *Clypeina delmatarum* Sokač & Velić i *Coniporella piriformis* Sokač & Velić, (Sokač & Velić, 1981c), uz koje se veže i primarno problematična forma opisana kao *Lacrymorphus catenaeformis* Radoičić, 1967).

Nedugo nakon pojave rodova *Korkyrella* i *Humiella* objavljen je kritički komentar Conrada (1982) u kojem se većina presjeka prikazanih od Sokača & Velića (1981a) smatra vrstom *Cylindroporella barnesii* Johnson, čime se rod *Korkyrella* uvodi u sinonimiju spomenute vrste. Prevođenjem vrste *Humiella teutae* Sokač & Velić, koja je predstavljala tip roda, u rod *Sarfatiella teutae*, rod *Humiella* uvršten je u sinonimiju roda *Sarfatiella*.

Prilikom uspostavljanja roda *Lagenoporella* Ott & Flaviani (1983) analiziraju vrste *Clypeina delmatarum* i *Coniporella piriformis* Sokač & Velić, te iznose mišljenje da se ove dvije vrste mogu povezati u jedinstveni oblik s karakteristikama roda *Lagenoporella*, pa ih i objedinjeno prezentiraju kao *Lagenoporella delmatarum* (Sokač & Velić) Ott & Flaviani.

Novija istraživanja (Masse et al., 1984) u pogledu međusobnog odnosa i pripadnosti vrste *Coniporella piriformis* Sokač & Velić (1981c), prema ranije opisanim *Lacrymorphus catenaeformis* Radoičić, (Radoičić, 1967) i *L. barremianus* Dragastan, (Dragastan, 1971) rezultiraju zaključkom da navedene vrste predstavljaju jedan te isti oblik, kojega ovi autori poistovjećuju s *Humiella teutae* Sokač & Velić. Dopunjujući karakteristike roda *Humiella*, dijelom na reviziji topotipskog materijala iz Dinarida a dijelom na osnovi srodnog iz Murges (Italija), navedeni autori formiraju n. comb. označivši navedene forme kao *Humiella catenaeformis* (Radoičić) Masse et al. Na ovu nov. comb. kao i na izbor neotipa iz talijanskog materijala osvrnuli su se već Cherchi & Schröder (1985).

Ova heterogenost interpretacija, pa vlastita zapažanja kao i potreba da se nominiraju pojedine forme nađene u zajednici s *Clypeina radici* Sokač, navele su me da već u toj prilici (Sokač, 1986) ukratko iznesem i svoja razmišljanja o taksonomskoj pripadnosti nekih od prethodno spomenutih forma, kao i neke od argumenata o njihovom stratigrafskom položaju u Dinaridima. Vezujući se na prethodno izneseno mišljenje, ali jasno naglašenu potrebu daljnjeg istraživanja (Sokač, 1986), koje ni ovom prilikom neće biti iscrpljeno, nameće se nužnost detaljnije analize i prikaza ilustrativne dokumentacije kao priloga daljnjem razmatranju spornih formi. Novo prikupljeni materijal i njegova obrada omogućuju da se razjasne neka sporna pitanja i revidira taksonomska pripadnost nekih od prethodno spominjanih dasikladacea. Bez i malo želje ili namjere da se ulazi u polemiku s bilo kojim autorom ili favorizira vlastito mišljenje, moram naglasiti da su zaključivanja pojedinog autora osnovana na njegovim vlastitim opažanjima onoga što i kako vidi. To uključuje mogućnost grešaka kojih je bilo i kojih će vjerojatno još biti, jer je često puta pred nama oskudan materijal kao i različito valoriziranje nekog od kriterija kojima se služimo, pa je eventualna greška daleko

od namjere nepoštivanja elementarnih pravila egzaktne tipifikacije. S tog aspekta moguća greška pojedinog autora ne bi se smjela pripisati nekoj školi, kao što je učinio Conrad (1982) apostrofirajući zagrebačku školu čime se neargumentirano obuhvaća širi krug autora, već samo onima koji su eventualnu grešku počinili. Evidentno je da se svi služimo približno istim kriterijima, ali smo daleko od zajedničkog zaključka kojima od njih dajemo prioritet. Zato su individualna razmišljanja i zaključivanja još uvijek prisutna, bez namjere da se griješi u klasifikaciji, tim više što su često nejasni, brojem i raznovrsnošću presjeka oskudni ostaci podložni subjektivnoj interpretaciji autora. Na prethodno veže se i zahtjev za respektiranjem lokacije tipskih nivoa; ako se pod tim treba podrazumijevati stratigrafski nivo određen prilikom originalnog opisa nekog taksona onda je takav zahtjev neopravdan i neprihvatljiv, pogotovo kada je taj nivo određen manjkavom i u pogledu raspona ne karakterističnom zajednicom, premda sam mišljenja da raspon pojedinih taksona ne treba mijenjati na osnovi problematične odredbe. Striktno poštivanje tipskih nivoa (ako sam to ispravno shvatio) dovelo bi u pitanje mogućnost migracije, promjena sredina i uvjeta sedimentacije kao pogodnih ili nepogodnih za život nekog taksona ili cjelokupne zajednice. Ukupni vertikalni raspon pojedinog taksona vjerodostojniji je ako se osniva na većem broju nalaza i međusobno udaljenih lokaliteta, pa ako je prisutan i u različitim sredinama sedimentacije, što opet ne znači da u nekom užem području pojedina vrsta ne može imati manja i za to područje uži karakteristični stratigrafski raspon.

Analiza roda *Korkyrella* (Sokač & Velić, 1981a) i kasnijeg komentara  
o ovom rodu (Conrad 1982)

Prilikom uspostavljanja roda *Korkyrella* Sokač & Velić (1981a) analiziran je materijal s otoka Korčule, koji je prikazan u više različitih presjeka dijelom pokazujući identičnost a dijelom samo sličnost s nejasno opisanom i lošim materijalom predstavljenom vrstom *Salpingoporella texana* Johnson, (Johnson, 1965, p-p. 719—720, Pl. 89, fig. 5—9), što je i uvjetovalo da se prioritetom ova vrsta smatra tipičnom vrstom za rod *Korkyrella*. Prvobitni opis kakvog su dali Sokač & Velić (1981a), danas sasvim izvjesno bio je protkan netočnostima i povod da se, uz neke sličnosti s rodom *Cylindroporella*, postavi pitanje validnosti roda *Korkyrella*. Na ovo pitanje u svojoj kritičkoj analizi osvrnuo se Conrad (1982), jasno naznačujući da forma opisana pod nazivom *Korkyrella texana* (Johnson) predstavlja sinonim vrste *Cylindroporella barnesii* Johnson. Iz ovog razloga — da se ospori ili potvrdi validnost roda *Korkyrella* — uz ponovljenu analizu postojećeg materijala izvršeno je prikupljanje i analiza novog iz stratigrafski identičnog nivoa s otoka, Mljeteta i zapadne Istre. Na osnovi dopunskih istraživanja došlo se do novih spoznaja za koje vjerujem da će doprinijeti da se s više ili manje prihvatljivih argumenata objektivno raspravi o greškama učinjenim prilikom prvobitnog opisa roda *Korkyrella* kao i o onima učinjenim prilikom kasnijeg komentara o ovom rodu (Conrad, 1982). Da bi se isključile dileme i daljnje zabune koje su moguće usporedbom materijala prikazanog od različitih autora, potrebno je diferencirati što bi moglo pripadati kojem od rodova, *Cylindroporella* ili *Heteroporella* odnosno nekom trećem — *Korkyrella*, što je eventualno samo slično, a što je u takvom stanju očuvanosti i predstavljeno takvim presjecima da onemogućava korektnu determinaciju. Današnja analiza presjeka ilustriranih od Sokač & Velić (1981a, Tab. I—III) pokazuje da je materijal heterogenih karakteristika objedinjen u jedinstvenu formu pod nazivom *Korkyrella texana* (Johnson). Neki presjeci (Sokač & Velić 1981a, Tab. II, sl. 1, 11) pokazuju raspored pora fertilnih ogranaka u vertikalnim i horizontalnim nizovima uz prisutnost pora i sterilnih ogranaka, koje prvobitno nismo uočili. Na presjeku Tab. II, fig. 1 jasno se zapaža i prelaz gornjeg proširenog dijela talusa u donji suženi (stapku), gdje su prisutni samo sterilni ogranci naizmjeničnog rasporeda. Spomenuti raspored fertilnih ogranaka u vertikalnim i horizontalnim nizovima onemogućava da te presjeke uvrstimo u rod *Cylindroporella*. Ovim presjecima mogu se donekle samo vanjskim izgledom površine približiti presjeci prikazani na Tab. I, sl. 1—2, 6, ali bez mogućnosti da se utvrdi i njihova identičnost. Presjeci na Tab. I, sl. 7, 9; Tab. II, sl. 5?, 14?; Tab. III, sl. 4? upućuju na naizmjeničan raspored fertilnih ogranaka bez mogućnosti da se sigurno utvrdi prisutnost i sterilnih ogranaka, što samo eventualno uključuje mogućnost njihove pripad-

nosti rodu *Cylindroporella*. Ostale presjeke, Tab. I, sl. 3—5; Tab. II, sl. 6—7, 14 i Tab. III, sl. 1—3, 5—9, zbog slabe očuvanosti nije moguće definirati prema neki od njih, kao i oni prethodno navedeni, ispravno zapažanju Conrada (1982), posjeduju sterilne ogranke u fertilnom dijelu talusa. Ovo međutim ne omogućava njihovo jednoznačno pribravanje vrsti *Cylindroporella barnesii* Johnson, tim više što se različitost obrisa linija vanjske površine, koje variraju od nazupčane do valovite, pa gotovo ravne ili takve koja sugerira istaknute vapnenačke izdanke sterilnih ogranaka vidljivo na presjeku Sokač & Velić 1981a, Tab. I, sl. 8 ili ovdje Tab. I, sl. 3, 5 teško može svesti na varijacije oblika vanjske površine, kod iste forme u istom nivou, uvjetovano samo različitim stupnjem njezine očuvanosti. Problematično poistovjećivanje presjeka vizuelno različitih karakteristika u istu formu uočava se i kod Conrada (1982, Pl. I, fig. 1—9). Prma mojem mišljenju malo je vjerojatno, unatoč različitosti orijentacije presjeka i njihovog povećanja da se presjek (Conrad 1982, Pl. I, fig. 1) može pripisati istom obliku kao i presjeci na fig. 3, 7—9 na istoj tabli. Presjeci (Conrad, 1982, Pl. I, fig. 4—6) kao i znatan dio naših (Sokač & Velić, 1981a) osim što eventualno mogu sugerirati pripadnost nekom taksonu ne mogu biti mjerodavni za pouzdanu specifičnu determinaciju. Uključiti li se u razmatranje i presjek ilustriran od Johnson (1954, Pl. 93, fig. 2), ponovljeno ilustriran i od Conrad (1982, Pl. I, fig. 2), za kojega ovaj posljednji navodi da moguće pripada nekoj drugoj vrsti ili rodu, poistovjećivanje različitih ostataka u istu formu (*Cylindroporella barnesii*) vuče svoj korijen već od originalnog opisa (Johnson, 1954). Za specifičnu odredbu vrste *C. barnesii* ne mogu biti mjerodavni ni presjeci ilustrirani od Peybernès & Conrad (1979, Pl. II, fig. 4—5) kao ni presjek (Pl. II, fig. 6) prema označen *?C. barnesii*. Presjeke ilustrirane prije ili kasnije od različitih autora, koji u svom navodu sadrže cf. ili aff., ili su pak označeni samo generički, u pojedinim slučajevima slovo-brojanom oznakom nema potrebe uključivati u ovu analizu, jer već tako nominirani jasno naznačuju dilemu autora prilikom njihove determinacije.

Da zaključim, originalnim opisom vrste *Korkyrella texana* (Johnson) i tom prilikom ilustriranog materijala (Sokač & Velić 1981a, Pl. I—III) počinje se više grešaka: u jedinstvenu formu objedinjeni su presjeci različitih karakteristika s posljedicom simplificiranog i neadekvatnog opisa. Približno istu grešku, uz ispravno zapažanje sterilnih ogranaka u fertilnom dijelu talusa koje mi prvobitno nismo uočili, učinio je i Conrad (1982) objedinjujući naš cjelokupni materijal (izuzev pojedinih presjeka samo stapke) u vrstu *C. barnesii*. Konačno, cilj ove analize, koja generalno izuzev malobrojnih primjeraka obuhvaća materijal slabe očuvanosti i nejasne unutrašnje građe te varijabilnog oblika vanjske površine, nije utvrđivanje grešaka već demonstracija individualnih pristupa autora u determinaciji spornih presjeka koji eventualno samo dijelom (izuzimajući one potpuno jasne) mogu sugerirati njihovu generičku pripadnost.

Momentalno takvo stanje nameće potrebu a nove spoznaje i mogućnosti da se iz materijala (Sokač & Velić 1981a) kao i novo prikupljenog s otoka Mljeta i zapadne Istre izdvoje presjeci s naknadno uočenim specifičnim karakteristikama koje ih diferenciraju od rodova *Cylindroporella* i *Heteroporella* odnosno izvrši revitalizacija i da novi opis roda *Korkyrella* uz potpuno distanciranje od problematične forme *Salpingoporella texana* Johnson.

#### Reinterpretacija roda *Korkyrella*

Rod *Korkyrella* odlikuje se vapnenačkim skeletom jasno diferenciranim na gornji prošireni (fertilni) dio i donji suženi (stapku) u koji fertilni dio naglo prelazi. Validnost roda osniva se prvenstveno na rasporedu fertilnih i sterilnih ogranaka u proširenom dijelu talusa. Fertilni granci susjednih pršljena stoje pravilno jedan iznad drugog tvoreći vertikalne i horizontalne nizove. Sterilni granci također su u vertikalnim i horizontalnim nizovima ali u susjednim pršljenima naizmjeničnog su položaja pa je njihov broj, u pršljenu i u vertikalnom nizu za polovinu manji od broja fertilnih ogranaka. Prošireni (fertilni) dio talusa naglo se suzuje u stapku, koju karakterizira isključivo prisutnost sterilnih ogranaka.

Izdvajanjem samo nekih presjeka iz materijala (Sokač & Velić, 1981a, Tab. I—III) u rod *Korkyrella* izvršeno je jasno diferenciranje prema presjecima forme nalik na *S. texana* čime se stvarno prestala obaveza prioriteta prvobitnog imena što je i uvjetovalo da se ova vrsta opiše pod novim nazivom.

*Korkyrella ivanovici* n. sp.

Tab. I; Tab. II, sl. 1—2, 4—6, 8

**Podrijetlo imena:** vrsta je posvećena kolegi Anti Ivanoviću višegodišnjem suradniku u terenskim radovima.

**Tipični lokalitet:** otok Korčula oko 50 m od raskršća u naselju Brna na cesti za Pritžbu.

**Tipični slojevi:** dobro uslojeni smeđi dijelom rekristalizirani biomikriti, vršni barem — donji apt.

**Holotip:** uzdužno nešto kosi presjek prikazan u Sokač & Velić 1981a, Tab. II, sl. 1., ponovljeno na Tab. I, sl. 1, sadržan je u preparatu Br-3.

**Dijagnoza:** s obzirom da je ova vrsta predstavnik monotipskog roda njezine osnovne karakteristike sadržane su u prikazu rada.

**Opis:** Ova alga predstavljena je skeletom od rekristaliziranog kalcita kod kojega je jasno naglašen gornji prošireni dio — fertilni i donji suženi stapka, kojim je alga za života bila prčvršćena za podlogu. Gornji prošireni dio talusa eliptičnog je oblika s relativno naglim prelazom u cilindričnu stapku nepoznate dužine. O građi unutrašnjeg fertilnog dijela alge, koji je kod promatranih presjeka razoren i ispunjen tamnim mikritom, moguće je pretpostaviti slabu kalcifikaciju i nastavljanje uske matične stanice ravnih stijenka iz stapke. Vanjska površina fertilnog dijela talusa očitava se neravnom nazupačnom linijom koja prelazom u stapku i duž stapke postaje ravna.

U proširenom dijelu talusa razvijeni su fertilni i sterilni ogranaci, dok su u stapki prisutni samo sterilni ogranaci. Međusobni raspored ovih različitih ogranaka i položaj istih u susjednim pršljenima ključna su karakteristika vrste i roda (v. definiciju roda i sl. 1). S obzirom na indikacije uočljive na otiscima fertilnog dijela talusa (Tab. II, sl. 5—6) pretpostavlja se podjela sterilnih ogranaka na distalnom kraju u četiri tanka nastavka. Sterilni ogranaci u stapki naizmjeničnog su rasporeda, okomiti na uzdužnu os te približno podjednake debljine do slabo naglašene tendencije laganog proširenja na distalnom kraju. Za sterilne ogranke ovog dijela talusa nema validne indikacije njihove podjele na distalnom kraju.

Dimenzije su navedene u engleskom tekstu.

**Sličnosti i razlike:** Redovito slaba očuvanost ove alge s najčešće razorenom unutrašnjom građom fertilnog dijela talusa, pa često odvojeni nalazi fertilnog od sterilnog dijela talusa, kao i sličnost pojedinih fragmenata i presjeka s nekim od predstavnika roda *Cylindroporella* (moguće i drugih rodova?) otežavala je njezinu pouzdanu determinaciju s posljedicom njezinog uvrštavanja u rod *Cylindroporella*. Vrsta *Korkyrella ivanovici* n. sp., a time i rod, osnovana je na rasporedu fertilnih i sterilnih ogranaka u fertilnom dijelu talusa. Usporedi li se shema rasporeda ogranaka za rod *Cylindroporella* i *Heteroporella* (Ott, 1968, sl. 1) s ovom ovdje i tangencijalnim presjekom (Tab. II, sl. 4) razlika između rodova *Cylindroporella* i *Heteroporella* s rodom *Korkyrella* odnosno s tipskom vrstom *K. ivanovici* postaje evidentna. Prema vrsti *C. barnesii* kojoj je *K. ivanovici* najčešće pripisivana razlika je izražena i u obliku skeleta talusa. *C. barnesii* predstavljena je cilindričnim segmentima ušiljenim na oba kraja (Johnson, 1954, Tab. 93, sl. 6—7) što sugerira njihovu međusobnu povezanost. Kod *K. ivanovici* takav oblik barem na osnovi presjeka i nekoliko promatranih otisaka nije moguće pretpostaviti, već samo napuhnuti (eliptični) fertilni dio i usku stapku očito veće dužine nego što bi se realno mogla pretpostaviti kod *C. barnesii*. S tog aspekta, kod nalaza samo stapke, ostaje neizvjesno da li takve ostatke treba isključivo pripisati vrsti *K. ivanovici* kod koje je postojanje stapke vidljivo (Tab. I, sl. 1; Tab. II, sl. 2), vrsti *C. barnesii* kod koje to, izuzev ušiljenih krajeva nije demonstrirano ali pojedini autori svojim odredbama to pretpostavljaju (Conrad, 1982., Conrad & Peybernes, 1979), ili moguće i nekoj drugoj vrsti, pa i rodu sličnog ili i različitog oblika talusa i građe. Objektivno, kod loše očuvanih presjeka nejasno vidljive građe i rasporeda ogranaka što je barem prema dosadašnjem materijalu i najčešći slučaj, nalaza samo stapke, mogućnost zamjene postoji tim više što se oblici sličnih karakteristika nalaze u istom nivou, pa i istom uzorku. Međutim, time s ne dovodi u pitanje validnost vrste već pouzdanost determinacije.

Stratigrafski položaj: *K. ivanovići* na tipskom lokalitetu nađena je neposredno ispod prvih nalaza *Palorbitolina lenticularis* (Blumenbach) u zajednici s *Triploporella bacilliformis* Sokač, *T. marsicana* Praturlon, *Salpingoporella* sp., istog položaja ali u siromašnoj fosilnoj zajednici prisutna je u zapadnoj Istri, pa na otoku Mljetu u nivou sa *Salpingoporella melitae* Radoičić, *Salpingoporella urladanasi* Conrad et al. i dr. što uz još neke nalaze sumirano upućuje na njezino prisustvo u gornjem baremu i donjem aptu.

Rod *Humiella* Sokač & Velić 1981, emend. Masse et al. 1984.

Rod *Humiella* uspostavljen je opisom vrste *H. teutae* Sokač & Velić (1981b) kojom prilikom su zbog nepovoljne očuvanosti, jake rekristalizacije vapnemačkog skeleta, njegove površinske abradiranosti te neuočenih sitnih pora u stijenkama skeleta između fertilnih ogranaka kao i samim ovojnicama ovih ogranaka dane nepotpune karakteristike roda. Manjkavost takvog opisa, pretežno temeljenog na vanjskom izgledu, rezultirala je sličnošću karakteristika rodova *Humiella* i *Sarfatiella* što je vjerojatno i navelo Conrada (1982) da vrstu *H. teutae* prevede u već postojeći rod *Sarfatiella*. Gotovo identični razlozi prvenstveno nedostatak našeg navoda (Sokač & Velić, 1981b) o postojanju pora koje bi se mogle pripisati sekundarnim ograncima na sporangijima i sterilnim ograncima u dijelovima talusa između pršljena fertilnih ogranaka rezultiraju uspostavljanjem roda *Lagenoporella* Ott & Flaviani (1983) kojega je tipična vrsta bila *Lagenoporella sardiniensis* Ott & Flaviani. Kompleksniju analizu roda *Humiella* proveli su Masse et al. (1984), dijelom revizijom topotipskog materijala a dijelom na osnovi promatranja primjeraka iz vapnenaca Monte Ricca kojega su zajednički imenovali *Humiella catenaeformis* (Radoičić) Masse et al. Ukupna razmatranja ovih autora temeljena su prvenstveno na karakteristikama materijala iz Murge kod kojih je na izvjesnom broju vidljiva perforacija stijenke sporangijskih ogranaka (ampula), a što se, prema njihovom zapažanju nazire i na presjeku prezentiranom od nas (Sokač & Velić, 1981b, Tab. II, sl. 8). Iz ovoga slijedi dopuna karakteristika roda *Humiella*, pa se uz već postojeće (Sokač & Velić, 1981b) kao značajno navodi perforiranost ampula. U kontekstu razmatranja odnosa vrste *Humiella teutae* prema vrstama *Lacrymoporus catenaeformis* Radoičić, *L. barremianus* Dragastan i *Coniporella piriformis* Sokač & Velić isti autori iznose mišljenje da sve ove različito nominirane forme predstavljaju jedan te isti organizam kojega označuju *Humiella catenaeformis* (Radoičić). Dopuna roda *Humiella* (Masse et al., 1984) kojemu se prema talijanskom materijalu pridaje perforacija stijenka ampula nije mogla biti u potpunosti prihvaćena jer ova karakteristika u tom momentu nije bila jasno uočena i na topotipskom materijalu odnosno vrsti *Humiella teutae*. Iz ovog razloga Cherchi & Schröder (1984) mišljenja su da generičko pripisavanje talijanskog materijala rodu *Humiella* (*H. catenaeformis*) ostaje neizvjesnim s naglaskom potrebe daljnje studije. Identični razlozi akceptirani su i u mojoj interpretaciji (Sokač, 1986) što je rezultiralo da se u tom momentu rod *Lagenoporella* smatra još validnim, pa su sukladno tome i forme prethodno različito nominirane, a s perforiranim ampulama i stijenka talusa, i pribrojene ovom rodu. Međutim, već tom prilikom, potaknut zapažanjima Masse et al. (1984) sugerirana je, u tom momentu još nedovoljno jasna, perforacija ovojnice ogranaka i dijelova skeleta između pršljena pa je time bila ostavljena mogućnost kasnije korekcije u pogledu taksonomske klasifikacije ovisno o rezultatima daljnjih istraživanja. Naknadno provedena istraživanja u okviru ove analize kojima je obuhvaćen postojeći topotipski materijal vrste *Humiella teutae* kao i novo izrađeni presjeci iz uzoraka ovog lokaliteta upotpunjuju sliku karakteristika roda *Humiella* kod koje se potvrdila perforacija stijenke skeleta između pršljena ogranaka kao i samih ovojnica ogranaka. Prema ovome, prihvaća se dopuna karakteristika roda *Humiella* u smislu kako su to naveli Masse et al. (1984). S dopunjenim karakteristikama rod *Humiella* identificira se s kasnije uspostavljenim rodom *Lagenoporella* pa ovaj treba smatrati mlađim sinonimom roda *Humiella*.



*Humiella teutae* Sokač & Velić 1981

Tab. III; tab. IV, sl. 1—2, 4, 6

Unatoč postojećeg opisa (Sokač & Velić, 1981b) kasnije uočene nove osobine nameću potrebu izvjesnih dopuna, tim više što je ova vrsta predstavnik roda.

Prvobitan navod o primarnom korastom plaštu koji je obavijao meke dijelove biljke s mogućnošću samo sekundarne kalcifikacije može se korigirati s vjerojatnošću naknadne rekristalizacije vapnenačkog skeleta na koju ukazuje nešto svjetlija zona sitnozrnog kalcita prisutna s unutrašnje a nešto rjeđe i s vanjske strane tamnije linije kao vidljivih rubova skeleta. Jedna od bitnih karakteristika ključna za definiranje roda, a koja nije navedena u originalnom opisu, odnosi se na postojanje sitnih pora u dijelovima skeleta između pršljena fertilnih ogranaka kao i u sporangijskim ovojnicama, što se kod ovih posljednjih očituje kao plitka nazubljenost. Na postojanje ovih pora kod presjeka topotipskih primjeraka *H. teutae* ukazali su Masse et al. (1984) navodeći primjerak prikazan na Tab. II, sl. 8 (Sokač & Velić 1981b). Pažljivim promatranjem i drugih primjeraka ilustriranih od istih autora ove pore ili plitka nazubljenost dijelova skeleta između pršljena fertilnih ogranaka kao i na njihovim ovojnicama postaje uočljiva i na primjercima Tab. I, sl. 3, 6; Tab. II, sl. 7—9, odnosno na primjercima ilustriranim ovdje Tab. III; Tab. IV, sl. 1—2, 4, 6. Najčešće slaba vidljivost ovih sitnih pora ili plitke nazubljenosti posljedica je jake rekristalizacije kod ove forme kojom su maskirane ili izbrisane ove bitne značajke. Rujetko, ali na pojedinim primjercima ipak vidljivi uski kanalići u dijelovima talusa između pršljena čine se podjednako široki (Tab. III, sl. 1—3) s tendencijom laganog proširenja na distalnom kraju koji je redovito zahvaćen rekristalizacijom i trošenjem vanjske površine. Slično je s porama u ovojnicama fertilnih ogranaka kod kojih je distalno širenje nešto izraženije. O karakteru rasporeda pora, bez mogućnosti da se to i vidi, teško je nešto određeno reći ali sam mišljenja da je vjerojatno aspondilan. Istovjetno ostalim vrstama ovoga roda, pore u dijelovima talusa između fertilnih pršljena mogu se pripisati sterilnim asimilacijskim ogranacima, dok pore u ovojnicama fertilnih ogranaka predstavljaju neku vrstu sekundarnih ogranaka s istovrsnom funkcijom kakvu imaju i sterilni ogranaci.

Ostale značajke ove vrste navedene su u originalnom opisu.

Sličnosti i razlike: S navedenim dopunama karakteristika roda, vrsta *Humiella teutae* može se samo izgledom talusa usporediti i približiti predstavnicima roda *Sarfatiella* od kojih se kao i drugih sličnih diferencira perforacijama prisutnim u stijenkama skeleta i ovojnicama fertilnih ogranaka. Na osnovi identičnih karakteristika građe rodu *Humiella* u ovom momentu pribrojene su četiri prethodno opisane ali različito nominirane vrste, a peta se pridodaje opisom nove. Validnost vrsta (*Humiella teutae*, *H. sardiniensis*, *H. delmatarum*, *H. catenaeformis* i *H. ? pupnatensis* n. sp.) temelji se na mogućnosti njihovog međusobnog razlikovanja. *Humiella teutae* diferencira se od *H. sardiniensis* gotovo upola manjim dijametrom matične stanice, te blago valovitim unutrašnjim rubom što odgovara blagom ugibanju unutrašnje površine na mjestima izrastanja fertilnih ogranaka. Razlika između ovih vrsta evidentna je i brojem fertilnih ogranaka u jednom pršljenu koji je gotovo upola manji kod *H. teutae* u odnosu na *H. sardiniensis*. Unatoč generalne sličnosti oblika sporangijskih ogranaka kod obje vrste, njihova detaljnija usporedba pokazuje i ovdje stanovite razlike. Sporangijski ogranaci *H. sardiniensis* redovito su jasno izdiferencirani u relativno dugu dršku i napuhnuti distalni kraj s često vidljivim zadebljanjem na prelazu drške u vanjski mjehur, što nije slučaj u *H. teutae*. Kod nje naime ovi ogranaci variraju od kruškastih tj. postupno se šire od same baze (Sokač & Velić, 1981b, Tab. I, sl. 6; Tab. II, sl. 7—8) do onih uočljive ali kraće drške u naglog distalnog proširenja bez vidljivog odebljanja na mjestu prelaza drške u mjehur (Sokač & Velić, 1981b, Tab. I, sl. 5; Tab. II, sl. 5). Usporedba *H. teutae* i *H. delmatarum* (usporedbu ove posljednje prema *H. sardiniensis* dali su Ott & Flaviani, 1983) pokazuje da *H. delmatarum* ima valovitost unutrašnjeg ruba, veći dijametar matične stanice, veću udaljenost susjednih pršljena i grublju perforiranost stijenke skeleta kao i stijenke proksimalnog dijela ogranaka (bazalnih dijelova ogranaka, Sokač & Velić, 1981c, Tab. II, sl. 1) nego što je to u *H. teutae*. Usporedba fertilnih ogranaka ovih dviju vrsta nije u potpunosti moguća s obzirom da nedostaju presjeci na kojima bi bila vidljiva njihova veza s ostalim dijelovima talusa kod *H. delmatarum*. Za-

jednička pojava *H. delmatarum* i odvojenih fertilnih ogranaka koji se pripisuju vrsti *H. catenaeformis* kao i poistovjećivanje *H. catenaeformis* s *H. teutae*, (Masse et al. 1984) potencira značenje razlike između ove tri posljednje vrste što će biti analizirano u okviru prikaza *H. catenaeformis*.

*Humiella sardiniensis* (Ott & Flaviani), n. comb.

Tab. V—VI

Postojeći opis (Ott & Flaviani, 1983) ne zahtijeva potrebu nekih novih dopuna izuzev mišljenja da su pore sterilnih ogranaka u dijelovima talusa između fertilnih pršljena aspondilnog rasporeda. Presjeci ilustrirani na Tab. V—VI, prilog su već postojećoj dokumentaciji ove vrste zastupane na više lokaliteta u karbonatnim naslagama beriasa srednjeg i jugoistočnog priobalnog pojasa Dinarida.

Usporedba *H. sardiniensis* s ostalim vrstama pribrojenim ovom rodu dijelom je dana prethodno, prilikom njezinog originalnog opisa, ili će biti prikazana kasnije gdje to bude potrebno.

Stratigrafska pripadnost: S obzirom na stratigrafski položaj *H. sardiniensis* na tipičnom lokalitetu i nešto više u spomenutom dijelu Dinarida iscrpnije ću se osvrnuti na njezin vertikalni raspon. Prema originalnom opisu vrsta je nađena u nekoliko slojeva unutar zone s *Campbelliella striata* (Carozzi) pa joj je time i stratigrafski položaj ispravno označen kao gornjojurski. Istraživanja provedena s tendencijom detaljne litofacijske i biofacijske analize karbonatnih naslaga više cjelovitih jurskih i donjokrednih profila u priobalnom području srednje i južne Dalmacije te dijela otoka pokazala su učestalost ove vrste nađene na većem broju lokaliteta redovito u istovrsnom stratigrafskom položaju. Promatranje rasporeda i ukupnog raspona pojedinih taksona i cjelokupnih zajednica u naslagama ispod prvih nalaza *H. sardiniensis*, u zajednici s ovom vrstom i onih iznad njezinih zadnjih pojava, omogućuje da joj se raspon širi i na berias. Prvi puta u ovom području zapažena je u Biokovu i tada nominirana kao ostaci nedefinirane dasikladaceje. Nakon ovog slijeda daljnji nalazi u području sela Zavala (Hercegovina) južno od Huma (neposredno zaleđe Dubrovnika) na novim lokalitetima u Biokovu, pa na otoku Mljetu. Utvrđena je u intervalu karbonatnih naslaga biomikrita, biointramikrita i biosparita debljine 20—30 m koji leži 50—170 m iznad zadnjih nalaza *Campbelliella striata*, 25—80 m od zadnjih pojava *Clypeina jurissica* Favre i *Salpingoporella grudii* (Radoičić), a 15—40 m ispod prvih pojava *Pseudotextulariella salevensis* Charollais et al. i *Cuneolina tenuis* Velić & Gušić odnosno prvih pojava oblika roda *Cuneolina* ili općenito nešto više ispod nalaza *Epimastopora cekici* Radoičić i *Triploporella neocomiensis* Radoičić. U širem intervalu naslaga unutar kojih je nađena *H. sardiniensis* nađene su: *Salpingoporella katzeri* Conrad et al., *S. annulata* Carozzi, *Clypeina radici* Sokač, *Clypeina* sp., *Humiella delmatarum*, *H. catenaeformis*, *Pseudoclypeina crnogorica* Radoičić kao i fragmenti drugih ali ne definiranih dasikladacija što argumentirano ukazuje da ova vrsta koja se za navedeno područje može smatrati i repnom u ovom dijelu Dinarida zaprema berias.

*Humiella delmatarum* (Sokač & Velić, 1981) n. comb.

Tab. IV, sl. 3, 5

Ostaci ove vrste, rijetko nađeni u cjelovitijim fragmentima, prvobitno su uvršteni u rod *Clypeina* iz razloga koji su bili navedeni prilikom originalnog opisa (Sokač & Velić, 1981c). Nešto kasnije u okviru prikaza roda *Lagenoporella* Ott & Flaviani (1983) iznose mišljenje da se vrste opisane od Sokač & Velić (1981c) kao *Clypeina delmatarum* i *Coniporella piriformis* mogu objediniti u jedinstveni oblik kod kojega posljednja spomenuta predstavlja samo odvojene fertalne ogranke prve. Ovakvo konstruirana forma kod koje je bila spomenuta poteškoća uklapanja sporangija većih dimenzija u odnosu na udaljenost susjednih pršljena, bila je nominirana kao *Lagenoporella delmatarum* (Sokač & Velić) Ott & Flaviani, Masse et al. (1984) u oblicima od nas (Sokač & Velić, 1981c) označenih *Coniporella piriformis*, odnosno prema Ott & Flaviani (1983) fertilnim ogranacima *Lagenoporella delmatarum*, ispravno prepoznaje ostat-

ke prije opisane pod nazivom *Lacrymophus catenaeformis* Radoičić. Sadašnjim razdvajanjem ovih dviju forma (*Clypeina delmatarum* = *Lagenoporella delmatarum* = *Humiella delmatarum* od *Lacrymophus catenaeformis* = *Coniporella piriformis* = *Humiella catenaeformis*) jedne od druge, te uvrštavanjem roda *Lagenoporella* u sinonimiju roda *Humiella* ostaje nedorečenost u interpretaciji vrste *Humiella delmatarum*.

Ponovna analiza postojećeg materijala i izrada novih izbrusaka nažalost nije rezultirala dobijanjem cjelovitih presjeka koji bi pokazivali matičnu stanicu s neotkinutim ogranacima, pa povezivanje presjeka matične stanice i pojedinih odvojenih ogranaka i dalje ostaje u domeni pretpostavke. Osnova uvrštavanja ove forme u red *Humiella* proizlazi ne samo iz prisutnosti pora sterilnih ogranaka na talusu između fertilnih pršljena (što je poznato i kod roda *Clypeina*) nego je za njezinu rodovsku pripadnost mnogo značajnije postojanje pora vidljivih na rijetko očuvanim bazalnim dijelovima drške fertilnih ogranaka (Sokač & Velić, 1981c, Tab. II, sl. 1—2). Zajednički nalazi vrsta *H. catenaeformis* (Radoičić) (v. dalje) i *H. delmatarum* dozvoljavaju da vrsti *H. catenaeformis* pribrojimo uz odlomljene fertile ogranke opisane kao *C. piriformis* i rekristalizirane uzdužne i kose presjeke prethodno nedefinirane alge koji se odlikuju nešto debljim stijenkama osnovnog dijela skeleta, ravnim unutrašnjim rubom i nešto širom matičnom stanicom nego što je to u *H. delmatarum*. Na tim presjecima sve su pore podjednako sitne, nazire se njihov aspondilni raspored, a nedostaju krupnije pore koje bi označavale mjesto izrastanja fertilnih ogranaka, kao što je to vidljivo u *H. delmatarum* (Sokač & Velić, 1981c, Tab. II, sl. 2—3, i Tab. III, sl. 1). Ova pretpostavka objašnjava prvo, pojavu relativno velikog broja krupnih tikvastih ogranaka (Sokač & Velić, 1981c, Tab. I) od kojih se zbog rekristalizacije i slabe očuvanosti samo dio može sa sigurnošću poistovjetiti s presjecima pribrojanih *H. catenaeformis* (Tab. IV, sl. 7; Tab. VII, sl. 3; Tab. VIII) i drugo, njihovu veću dimenziju nego što bi to stvarno odgovaralo *H. delmatarum*. Kako smo mi kod prikaza *C. piriformis* (Sokač & Velić, 1981c, Tab. I) izabrali one krupnije i nešto bolje očuvane presjeke, vjerojatno je da vrsti *H. delmatarum* pripadaju ogranaci identičnog oblika (u izbruscima drugih i nema), ali manjih dimenzija i moguće slabije perforacije stijenke. Zaključak o općenito manjim fertilnim ogranacima kod *H. delmatarum* proizlazi iz ostalih karakteristika ove vrste: šire matične stanice za koju se čini da ne mora biti tako izrazito valovita kao što je to vidljivo kod holotipa (Sokač & Velić, 1981c, Tab. II, sl. 1), znatno tanjiji stijenka uzduž talusa, što cjelokupni skelet ove alge, u odnosu na *H. catenaeformis*, čini konstruktivno slabijim, pa se i manji fertilni ogranaci kao i njihovo odvojeno pojavljivanje u tom sklopu čine vjerojatnijim.

*Humiella catenaeformis* (Radoičić, 1967) Masse et al. 1984

Tab. IV, sl. 7; Tab. VII—X

Ova forma već relativno dugo prisutna u literaturi, taksonomski različito označavane pripadnosti, nije niti u prvobitnom prikazu (Radoičić, 1967), koji je na žalost zbog malog broja presjeka i općenito loše očuvanosti ograničen, niti kasnije u potpunosti opisana. Kasniji nalazi također su bili predstavljeni više ili manje rekristaliziranim fragmentima, ogranacima odvojenim od ostalog dijela talusa, ili pojedinačnim presjecima pršljena što nije omogućivalo da se sagleda njezina cjelokupna građa. Uzorci prikupljeni u naslagama donje krede otoka Mljeta sadržavali su brojne i do sada čini se najbolje očuvane ostatke ove alge koji omogućavaju novi dopunjeni prikaz njezinih cjelokupnih karakteristika.

Opis: Talus ove alge predstavljen je cilindričnim vapnenačkim skeletom, najčešće više ili manje rekristaliziranim duž kojega su u međusobno razmjerno velikoj udaljenosti postavljeni pršljeni od same baze potpuno individualiziranih fertilnih ogranaka. Matična stanica zaprema oko 20% dijametra u ravnini pršljena, dok se taj iznos u ravnini između fertilnih pršljena kreće u vrijednosti oko 50%. Točnost ovog posljednjeg iznosa može biti korigirana zbog razaranja vanjske površine. Unutrašnja površina perforirana je ulaznim porama sterilnih i fertilnih ogranaka. U presjecima zbog jake rekristalizacije očrtava se više ili manje, oštrom ravnom linijom (Tab. IX, sl. 1; Tab. X, sl. 3—4).

Fertilni ogranaci generalno oblika tikvice samostalni cijelom dužinom okomiti su na vapnenački cilindar. Distalno jaka napuhanost uvjetuje naizmjeničan ras-

pored fertilnih ogranaka, susjednih pršljena, njihov međusobni dodir, a ne rijetko deformiranost pa i manji dijametar pojedinih ogranaka (Tab. VII, sl. 3; Tab. VIII, sl. 1—2). Pomanjkanje uočljivih pora većih dimenzija uz unutrašnji rub kao i na površinama tangencijalnih presjeka sugerira povezanost fertilnih ogranaka s matičnom stanicom vrlo uskim kanalima (moguće tek jedva nešto širim od kanala sterilnih ogranaka) tako da razlučivanje kanala sterilnih i fertilnih ogranaka nije moguće. U skladu s time se drške fertilnih ogranaka u bazi izrazito stanjuje (Tab. IV, sl. 7). Već spomenute pore u ovojnici fertilnih ogranaka koje se pripisuju sekundarnim ograncima pokazuju tendenciju laganog distalnog proširivanja. Sterilni ogranci razvijeni u dijelovima talusa između fertilnih pršljena, okomiti ili malo kosi komuniciraju s matičnom stanicom posredstvom sitnih pora. Također pokazuju lagano proširenje prema distalnom kraju. Povremeni dojam razgranatosti sterilnih ogranaka ne može biti dokazan, pa se njihova mjestimična povezanost pretpostavlja kao posljedica sekundarnog razaranja. Raspored pora sterilnih ogranaka na površini talusa je nepravilan — aspondilan (Tab. VII, sl. 2).

Dimenzije su navedene u engleskom tekstu.

Sličnosti i razlike: *Humiella catenaeformis* (Radoičić) svojim ukupnim oblikama, izgledom talusa, prisutnošću sterilnih ogranaka u dijelovima talusa između fertilnih pršljena, oblikom fertilnih ogranaka, njihovom potpunom individualiziranošću već od same baze te porama u njihovim ovojnicama koje sugeriraju sekundarne ogranke, sadrži sve elemente koji ju nesumnjivo uvrštavaju u rod *Humiella* dopunjenih karakteristika. Unatoč generalne sličnosti *H. catenaeformis* razlikuje se od *H. teutae* ukupno nešto većim dimenzijama, naglašeno jačom perforiranošću odnosno širim kanalčićima sterilnih i sekundarnih ogranaka, pa znatno debljim stijenkama skeleta kako u dijelovima talusa između fertilnih ogranaka tako i ovojnicama fertilnih ogranaka. No osnovna i najuočljivija razlika je postojanje dvije vrste pora kod *H. teutae*: kod *H. teutae* fertilni ogranak («ampula») komunicira s matičnom stanicom jasno vidljivom krupnom porom koja dijametrom približno odgovara unutrašnjem promjeru proksimalnog dijela ogranaka, odnosno njegove drške (Sokač & Velić, 1981b, Tab. I, sl. 1, 3, 5, Tab. II, sl. 1), dok su kod *H. catenaeformis*, kao što je navedeno u opisu, sve pore podjednake dimenzija. Dakle, i u slučaju kad bismo tanju stijenku i sitnije pore (= uže kanaliće) sterilnih i sekundarnih ogranaka u *H. teutae* možda i mogli dovesti u vezu i eventualno smatrati sekundarnim posljedicama rekristalizacije i jačeg trošenja vanjske površine — kao što to sugeriraju Masse et al. (1984, p. 141) za obliteraciju pora — ostaje osnovna razlika u postojanju dva tipa pora kod *H. teutae* nasuprot podjednakim porama kod *H. catenaeformis*. Od *H. sardiniensis*, *H. catenaeformis* razlikuje se većim dimenzijama, većom debljinom stijenke skeleta, grubljom perforacijom, manjim brojem fertilnih ogranaka u pršljenu i njihovom nejasnom vezom s matičnom stanicom. Kod *H. sardiniensis* ulazna je pora, slično kao i kod *H. teutae* i *H. delmatarum*, jasno vidljiva. Uočljive razlike ove vrste izražene su i prema *H. delmatarum* koja je karakterizirana više ili manje valovitim unutrašnjim rubom, većim unutrašnjim dijametrom, tanjim stijenkama skeleta, većom udaljenošću susjednih pršljena fertilnih ogranaka i čini se manjim dimenzijama ogranaka nego što su kod *H. catenaeformis*.

Stratigrafski položaj: *Humiella catenaeformis* prema originalnom opisu (Radoičić, 1967) potječe na tipičnom lokalitetu iz starijeg neokoma, slojeva koji leže preko naslaga s »aberantnim tintininama« kojima je pridavana pripadnost beriasu, pa je s obzirom na ovo njezin stratigrafski položaj označen valendisom. Identičan stratigrafski položaj navodi se i za lokalitet na planini Njeguš (Radoičić, 1967), gdje ova alga leži ispod vapnenaca s *Triploporella neocomiensis* Radoičić. Stratigrafski položaj u nivou beriasa planine Biokovo obrazložen je već ranije (Sokač & Velić, 1981c) a detaljno je analiziran u prethodnom prikazu vrste *H. sardiniensis*. Dosadašnji nalazi *H. catenaeformis* u navedenim lokalitetima Dinarida identičnog su stratigrafskog položaja, koji se u odnosu na utvrđene fosilne zajednice u podini i krovini te prateću zajednicu unutar koje je ova vrsta nađena sa sigurnošću može definirati beriasom. Ostaci označeni *H. catenaeformis* prezentirani od Masse et al. (1984) i Leperto-Sinni & Masse (1984) ne mogu se zbog tankih stijenki i jasno različitih ulaznih pora fertilnih ogranaka pribrojiti ovoj vrsti već ih te osobine više približavaju vrsti *H. teutae*. Niti se *Lacrymorphus barremianus* Dragastan može

poistovjetiti s *H. catenaeformis*, već ga i dalje treba smatrati problematikumom. Iz ovih razloga stratigrafski položaj vrste *H. catenaeformis* u Dinaridima je dobro definiran kao berias, dok je njezina pojava u mlađim naslagama (mlađi neokom i barem) i dalje neizvjesna.

*Humiella?* *pupnatensis* n. sp.

Tab. XI—XII

**Podrijetlo imena:** ime vrste potječe od naziva naselja Pupnat na otoku Korčuli u blizini kojega je vrsta nađena.

**Tipični lokalitet:** izdanci uz cestu oko 2 km jugozapadno od naselja Pupnat na otoku Korčuli.

**Tipični slojevi:** biomikriti i rekristalizirani biointramikriti gornjeg barama.

**Holotip:** kosi presjek prikazan na Tab. XI, sl. 1 sadržan u preparatu KP-7.

**Dijagnoza:** Sitna vapnenačka alga cilindričnog talusa duž kojega se u pravilnim intervalima smjenjuju dva do tri pršljena sterilnih ogranaka s pršljenom fertilnih ogranaka. Fertilni ogranaci oblika roga na vanjskom dijelu nose sekundarne ogranke.

**Opis:** Sitna vapnenačka alga prezentirana većim brojem različito orijentiranih presjeka pokazuje jednostavan nerazgranjen talus cilindrične forme. Specifičan izgled talusa uvjetovan je postojanjem dvije vrste ogranaka od kojih duži fertilni strše poput rogova pa se dobija dojam bodljastog izgleda talusa (Tab. XI, sl. 5—6; Tab. XII, sl. 1). Matična stanica ravnih i oštro ocrtanih rubova zaprema najčešće 20—30%, ekstremno do blizu 50% ukupnog dijametra.

Duž talusa smjenjuje se oblikom a moguće i funkcijom dva tipa ogranaka raspoređenih u pršljene. Pršljeni dužih, oblikom rogu sličnih, organaka pojavljuju se na talusu u pravilnim intervalima koje sačinjavaju dva do tri pršljena manjih ogranaka. Ovi duži vjerojatno fertilni ogranaci izlaskom iz matične stanice odebljavaju u distalno se postupno sužuju. Oni nose rijetko očuvane sekundarne ogranke koji su na promatranim presjecima vidljivi u vanjskoj polovini fertilnog ogranaka (Tab. XI, sl. 1). Svaki od fertilnih ogranaka nalazi se u vlastitoj vapnenačkoj ovojnici, pa su samostalni od same baze premda su ovojnice susjednih ogranaka istog pršljena u prvoj četvrtini ili trećini proksimalnog dijela u međusobno uskom kontaktu, dok se u dvije vanjske trećine sužavanjem ogranaka oni u potpunosti individualiziraju. Drugi tip, kraćih vjerojatnih sterilnih ogranaka također pršljenastog rasporeda zaprema dijelove talusa u intervalima između fertilnih (dužih) ogranaka. Svaki od ovih intervala sadrži dva do tri pršljena sterilnih (kraćih) ogranaka (Tab. XI, sl. 2—3; Tab. XII, sl. 2—3). I ovi ogranaci, koji se šire prema vanjskom kraju gdje su i nešto izrazitije spljošteni, posjeduju vlastite ovojnice (Tab. XI, sl. 2—3; Tab. XII, sl. 2—3, 7) s međusobnim jačim ili slabijim kontaktom ili su u krajnjem slučaju i oni potpuno individualizirani. Sterilni ogranaci susjednih pršljena stoje naizmjenično a zbog svoje spljoštenosti u tangencijalnom presjeku više su ili manje eliptičnog oblika, i sličnošću se u tom presjeku približavaju fertilnim ograncima pa je njihovo razlikovanje otežano. Dimenzije su navedene u engleskom tekstu.

**Sličnosti i razlike:** Osnovni elementi građe ove alge, nerazgrađeni talus duž kojega se smjenjuju intervali s dva do tri pršljena kraćih vjerojatno sterilnih ogranaka s pršljenima dužih vjerojatno fertilnih ogranaka koji nose sekundarne ogranke, u osnovi odgovara tipu građe roda *Humiella* što je i uvjetovalo da se vrsta priključi ovom rodu. Razlike prema do sada poznatim i prethodno prikazanim vrstama roda *Humiella* izražene su oblikom fertilnih ogranaka koji su u ove vrste poput roga za razliku od ostalih koje se odlikuju više ili manje tikvastom formom fertilnih ogranaka. Nadalje razlika je posebno naglašena u formi i rasporedu sterilnih ogranaka što je i navelo da njezinu pripadnost rodu *Humiella* u ovom momentu smatram još nesigurnom. Kod ostalih vrsta roda *Humiella* sterilni ogranaci su tanki s tendencijom laganog proširenja na distalnom kraju i aspidinog su rasporeda što je međutim u potpunosti evidentno samo u vrste *H. catenaeformis*, dok se to za ostale objektivno može tek pretpostaviti, kod *H.?* *pupnatensis* ovi ogranaci su pršljenastog položaja, posjeduju vlastitu vapnenačku ovojnicu i međusobno su naizmjeničnog rasporeda. U dije-

lovima pojedinih presjeka ove vrste mogla bi se naći djelomična sličnost s dijelovima nekih presjeka vrste *Clypeina sornatica* Conrad et al. kod koje međutim nema dva tipa ogranaka, pa je njihova razlika unatoč istovrsnog stratigrafskog položaja, očita.

Stratigrafski položaj: *Humiella?* *pupnatensis* n. sp. na tipičnom lokalitetu otoka Korčule nađena je u zajednici s ostacima nesigurno definiranih alga grupe *Salpingoporella genevensis* (Conrad), grupe *Salpingoporella melitae* Radčić, za uže stratigrafsko horizontiranje ne tipičnih foraminifera: *Nezzazata simplex* Omara, *Sabaudia minuta* (Hofker), *Debarina hahounerensis* Fourcade et al., *Pseudotextulariella?* *scarsellai* (De Castro) i dr., ali što je za ovaj lokalitet značajnije ne daleko ispod prvih nalaza *Palorbitolina lenticularis* (Blumenbach). Ovakav položaj upućuje na njezinu pripadnost baremu. U području južno od Huma (zaleđe Dubrovnika) raspon ove vrste prati se iz barema u donji apt pa se za sada ukupni raspon *H.?* *pupnatensis* može označiti gornji barem — donji apt.

#### PLATE — TABLA I

##### 1—5. *Korkyrella ivanovici* n. sp.

- 1—2. Longitudinal — oblique sections (uzdužno — kosi presjeci); × 46
3. Oblique section through the fertile part of the thallus (kosi presjek kroz fertilni dio talusa); × 46
4. Longitudinal section (uzdužni presjek); × 46
5. Longitudinal — slightly oblique section through the fertile part of the thallus (uzdužno — nešto kosi presjek kroz fertilni dio talusa); × 60

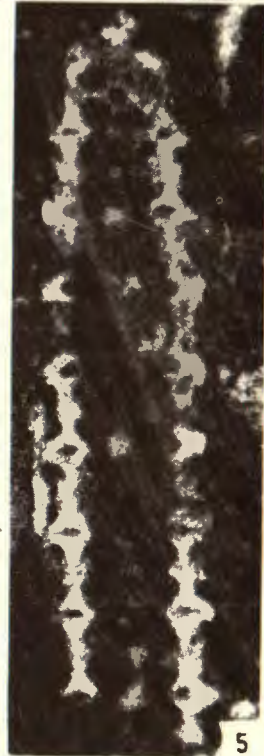
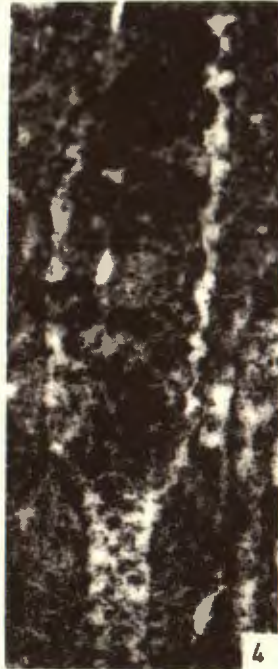


PLATE — TABLA II

1—2, 4—6, 8. *Korkyrella ivanovici* n. sp.  
3, 7. *Cylindroporella* sp.

1. Tangential — oblique section through the fertile part of the thallus (tangencijalno — kosi presjek kroz fertilni dio talusa);  $\times 46$
2. Longitudinal — oblique section (uzdužno — kosi presjek);  $\times 46$
3. Tangential section (tangencijalni presjek);  $\times 59$
4. Tangential section (tangencijalni presjek);  $\times 55$
- 5—6, 8. External moulds of the »head« (otisak glave talusa);  $\times 17$
7. *Cylindroporella* sp. Outer view (vanjska površina);  $\times 17$



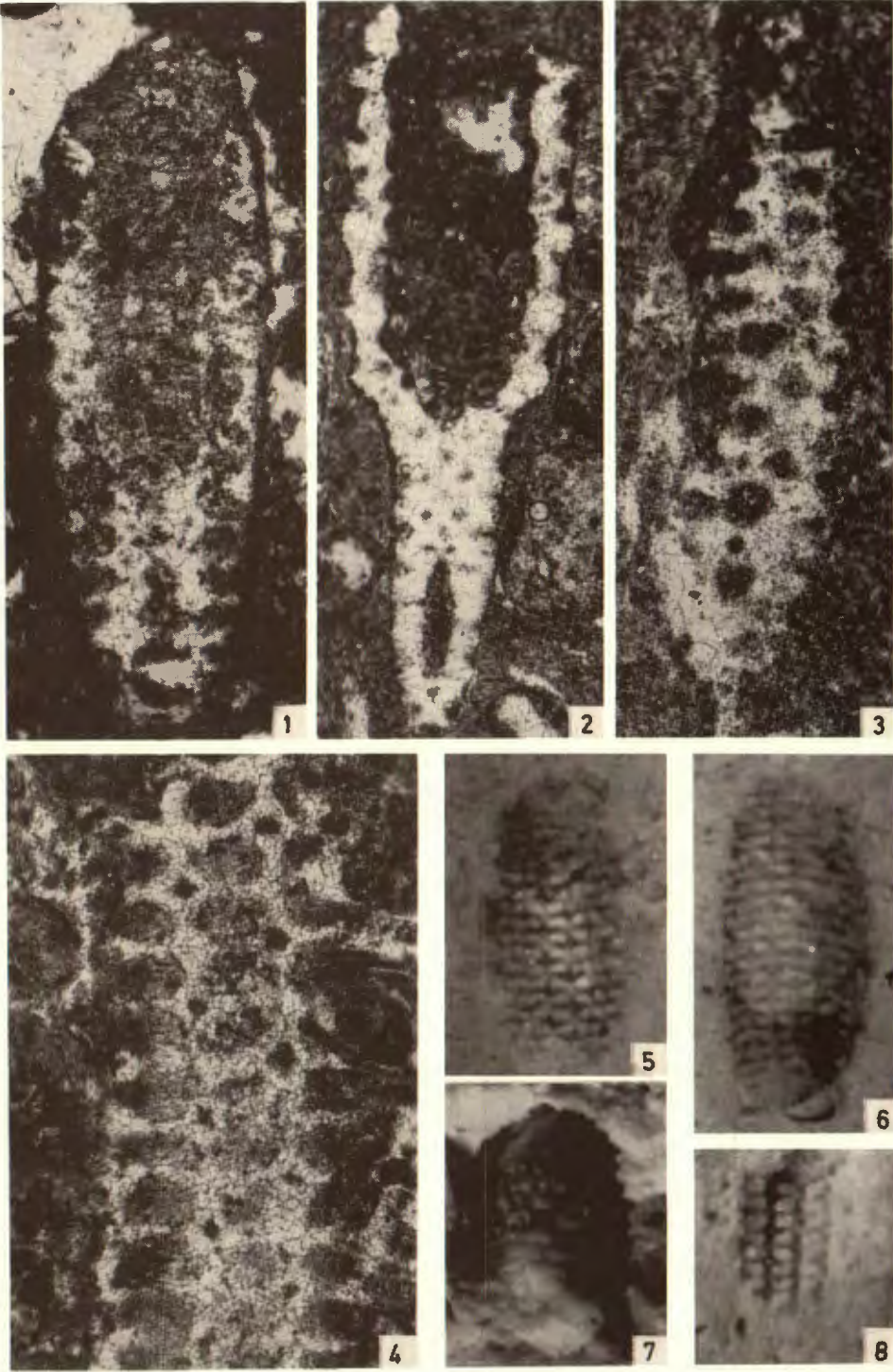


PLATE — TABLA III

1—4. *Humiella teutae* Sokač & Velić

1. Cross section (poprečni presjek); × 35

2—4. Slightly oblique cross sections (malo kosi poprečni presjeci); × 35

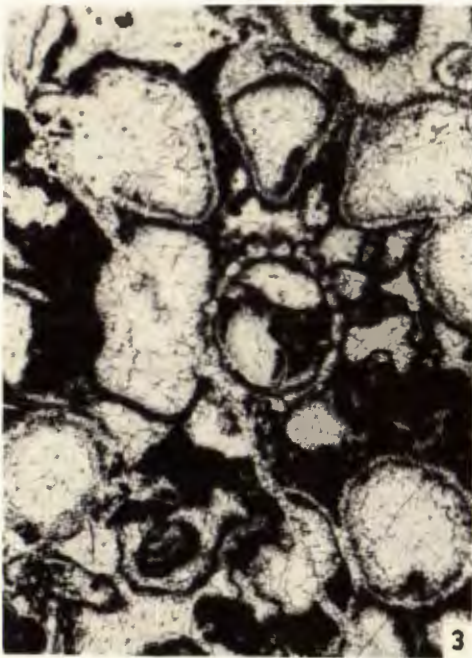
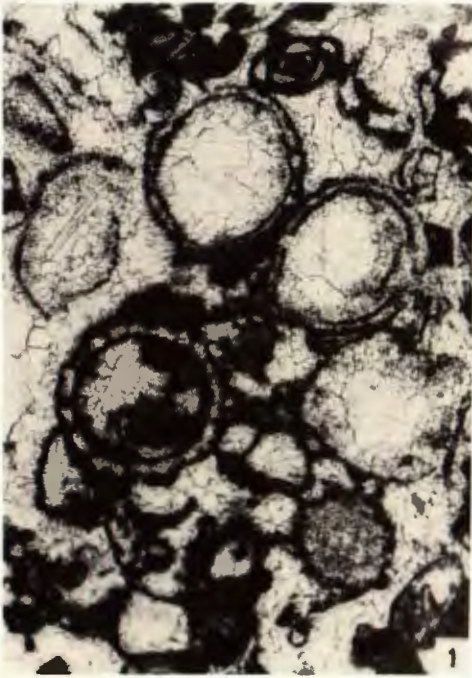


PLATE — TABLA IV

1—2, 4, 6 *Humiella teutae* Sokač & Velić  
3, 5 *Humiella delmatarum* (Sokač & Velić) n. comb.

1. Cross section (poprečni presjek); × 16
2. Oblique section (kosi presjek); × 25
3. Oblique section (kosi presjek); × 23
4. Section through the distal part of branches (presjek kroz vanjski dio ogranaka); × 28
5. Cross section (poprečni presjek); × 23
6. Section through a branch (presjek kroz ogranak); × 48
7. Longitudinal section through a branch (uzdužni presjek kroz ogranak); × 23

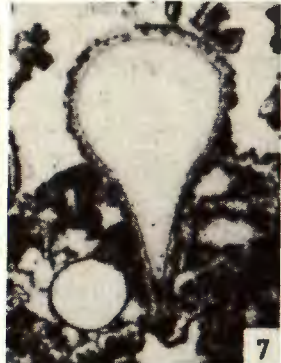
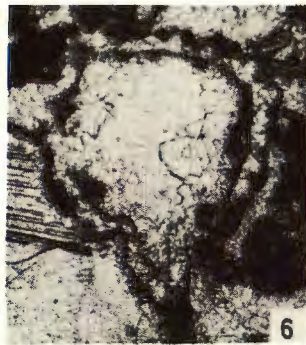
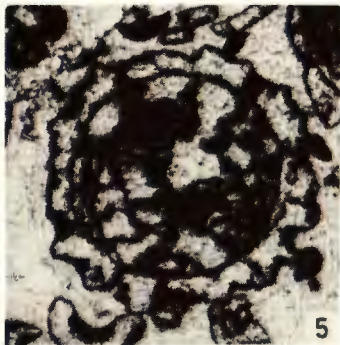
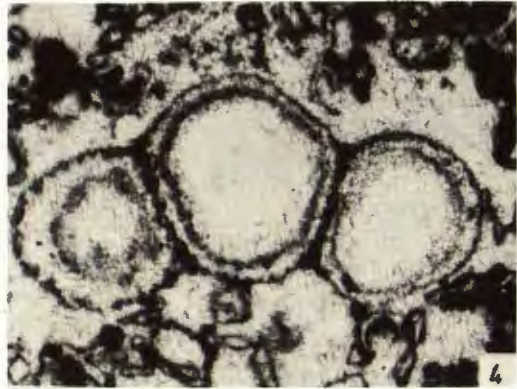
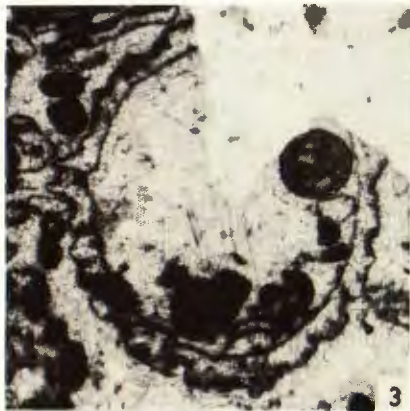
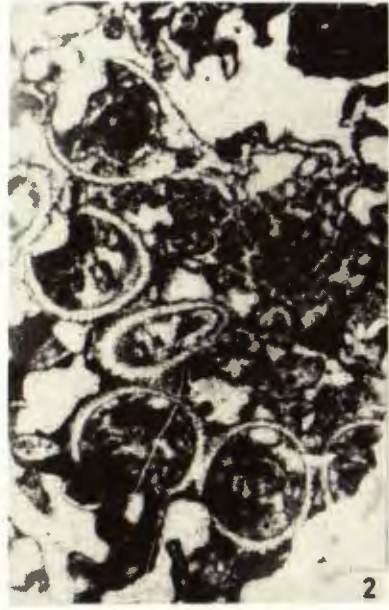
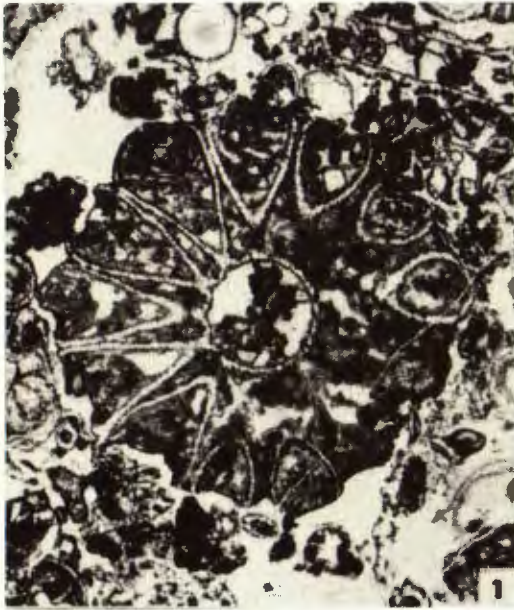


PLATE — TABLA V

1—4. *Humiella sardiniensis* (Ott & Flaviani) n. comb.

1. Oblique — tangential section (koso-tangencionalni presjek); × 18
2. Longitudinal section (uzdužni presjek); × 18
3. Oblique section (kosi presjek); × 18
4. Longitudinal section (uzdužni presjek); × 22

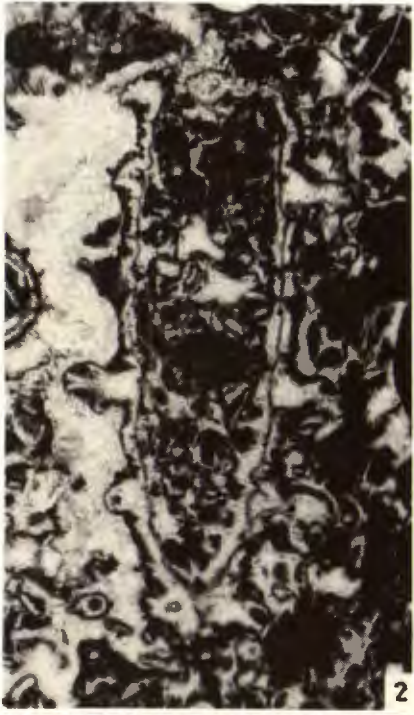
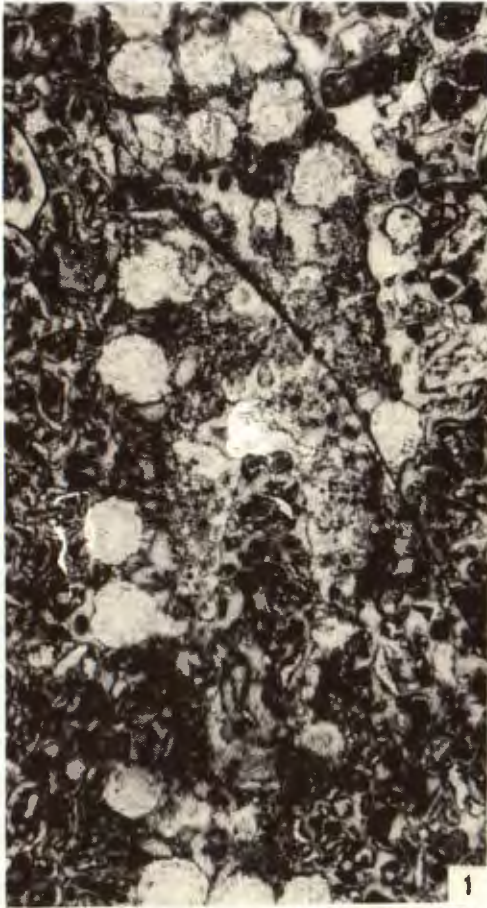


PLATE — TABLA VI

1—5. *Humiella sardiniensis* (Ott & Flaviani) n. comb.

1. A Slightly oblique cross section (malo kosi poprečni presjek)  
B Longitudinal — oblique section (uzdužno — kosi presjek); × 18
2. Longitudinal section (uzdužni presjek); × 18
3. Oblique cross section (poprečno-kosi presjek); × 18
4. Oblique section (kosi presjek); × 18
5. Cross section (poprečni presjek); × 25



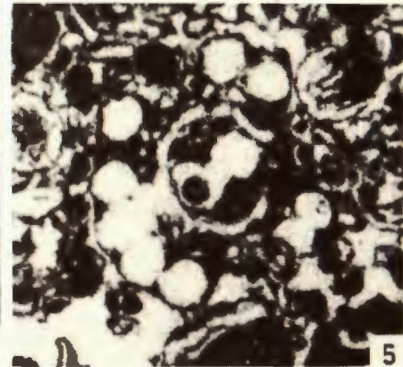
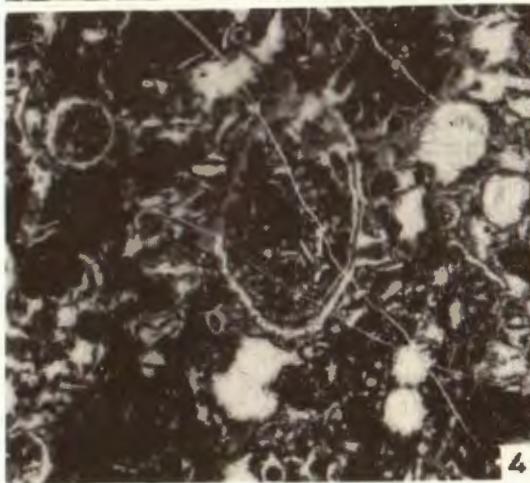
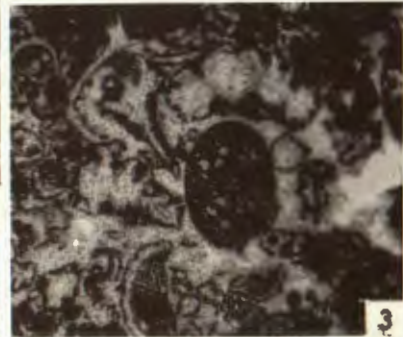
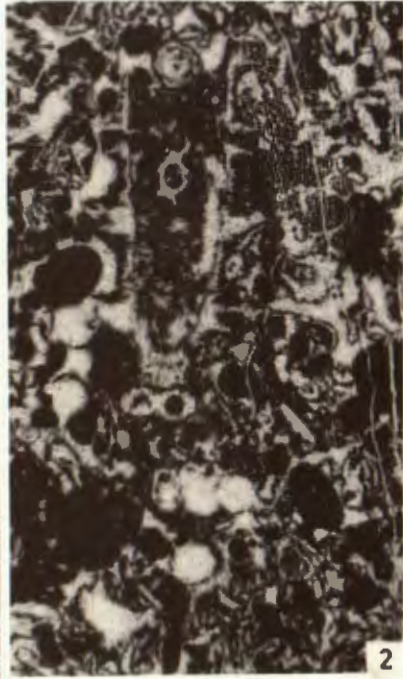


PLATE — TABLA VII

1—4. *Humiella catenaeformis* (Radovičić) Masse et al.

1. Oblique section through the cylindrical part of the thallus without branches (kosi presjek kroz cilindrični dio talusa bez ogranaka); × 21
2. Tangential — oblique section through the cylindrical part of the thallus without branches (tangencijalno — kosi presjek kroz cilindrični dio talusa bez ogranaka); × 23
3. Longitudinal section (uzdužni presjek); × 14
4. Oblique section through the cylindrical part of the thallus without branches (kosi presjek kroz cilindrični dio talusa bez ogranaka); × 23

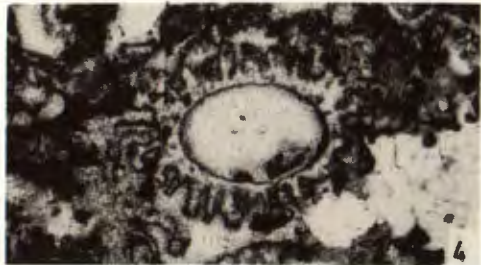
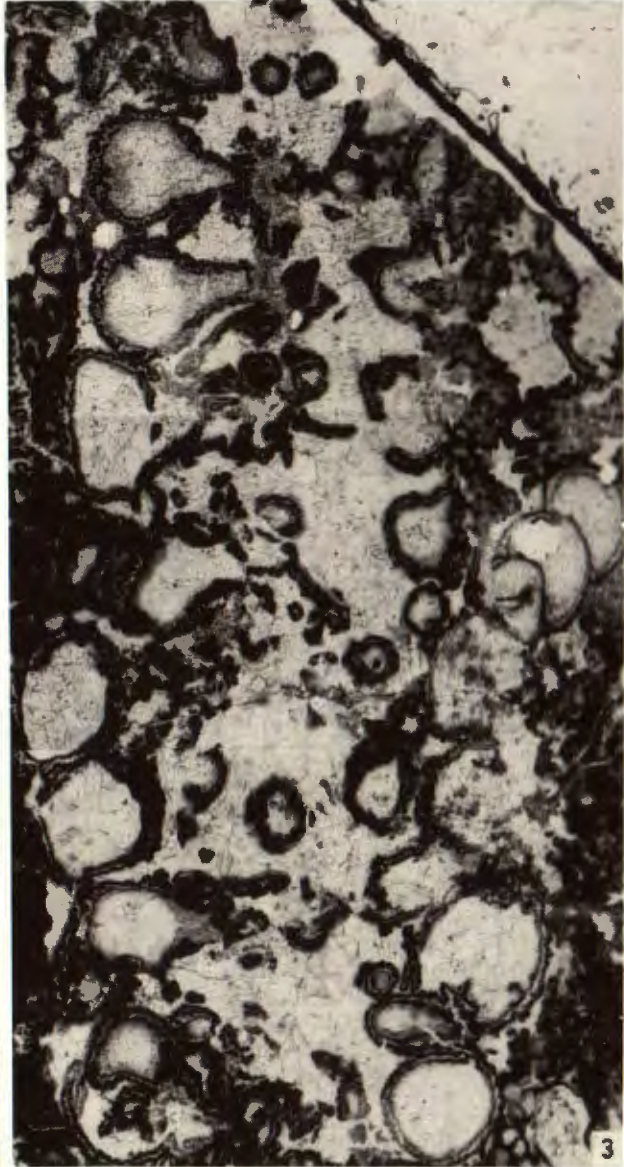
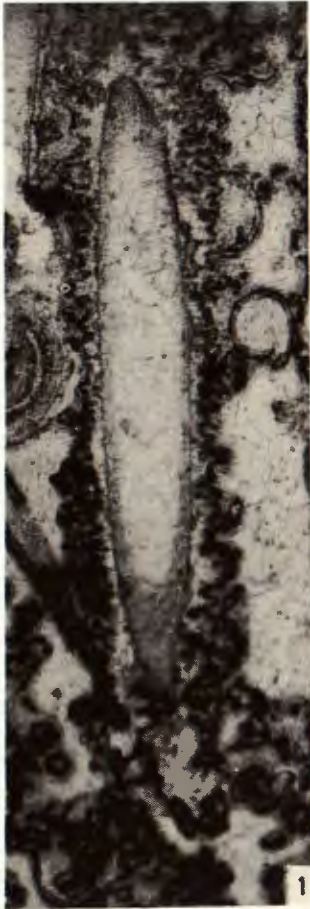


PLATE — TABLA VIII

1—2. *Humiella catenaeformis* (Radotić) Masse et al.

1—2. Oblique sections (kosi presjeci);  $\times 14$

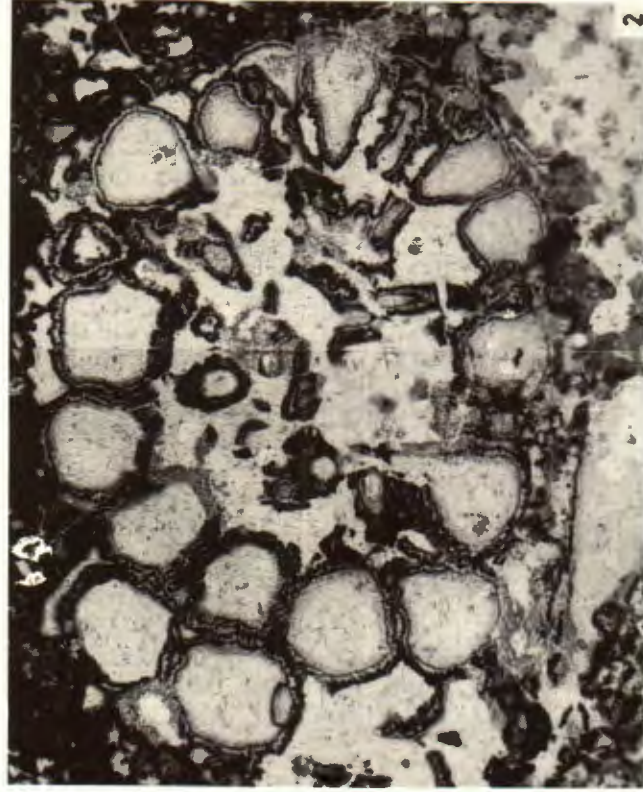
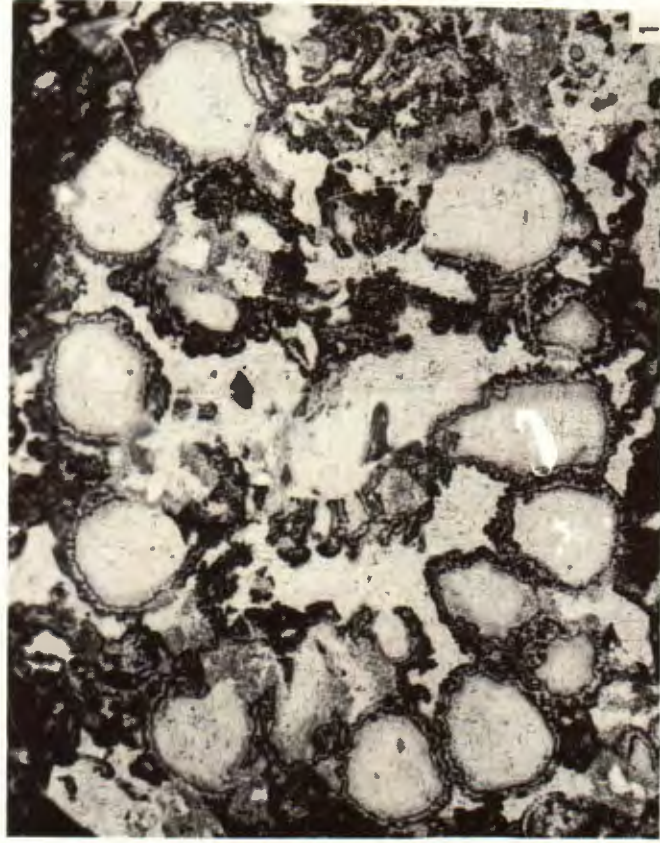


PLATE — TABLA IX

1—4. *Humiella catenaeformis* (Radoičić) Masse et al.

1. Longitudinal and oblique sections through the cylindrical part of the thallus without branches (uzdužni i kosi presjeci kroz cilindrični dio talusa bez ogranaka); × 26
- 2—4. Oblique sections through the cylindrical part of the thallus without branches (kosi presjeci cilindričnog dijela talusa bez ogranaka); × 23

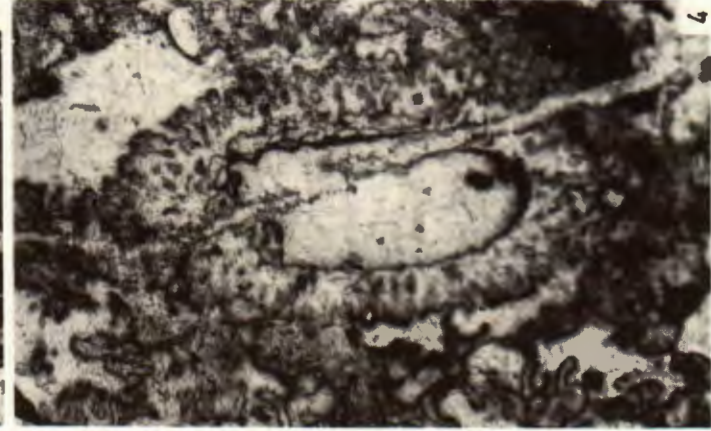
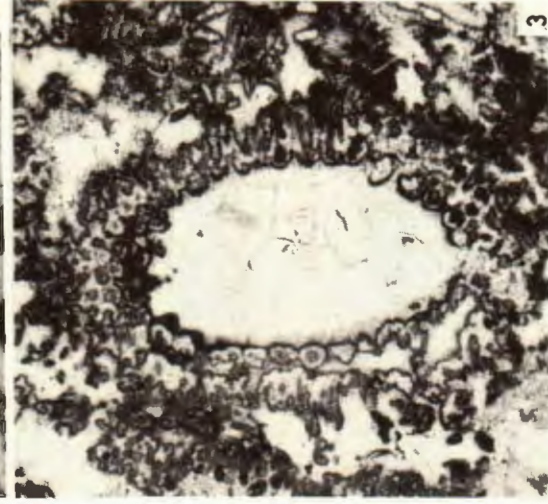
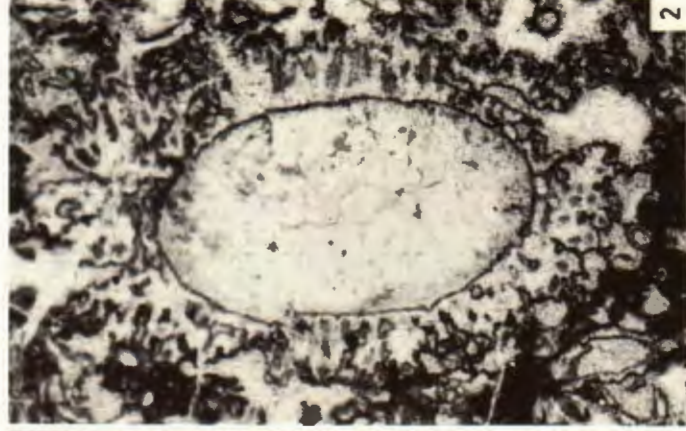
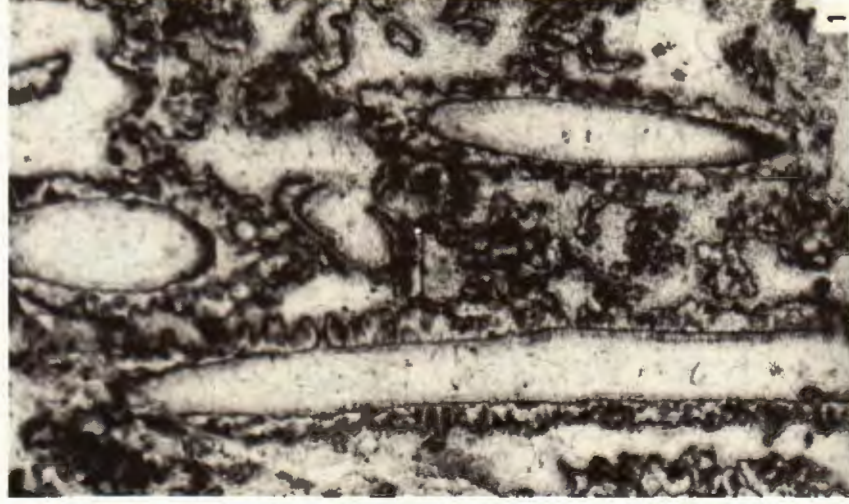


PLATE — TABLA X

1—4. *Humiella catenaeformis* (Radoičić) Masse et al.

1. Different sections through fertile branches and cylindrical parts of thallus (različiti presjeci kroz fertile ogranke i cilindrične dijelove talusa); × 16
2. Longitudinal section through the cylindrical part of the thallus without branches (uzdužni presjek kroz cilindrični dio talusa bez ogranaka); × 25
3. Longitudinal and oblique sections through the cylindrical part of the thallus (uzdužni i kosi presjeci kroz cilindrični dio talusa); × 16
4. Oblique sections through the cylindrical part of the thallus (kosi presjeci kroz cilindrični dio talusa); × 16



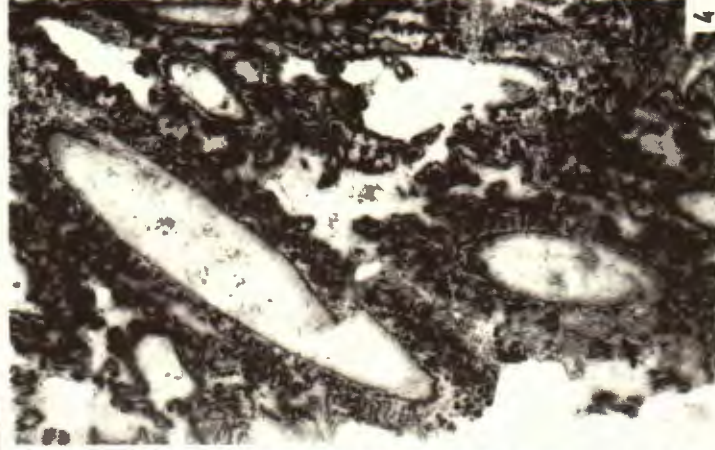
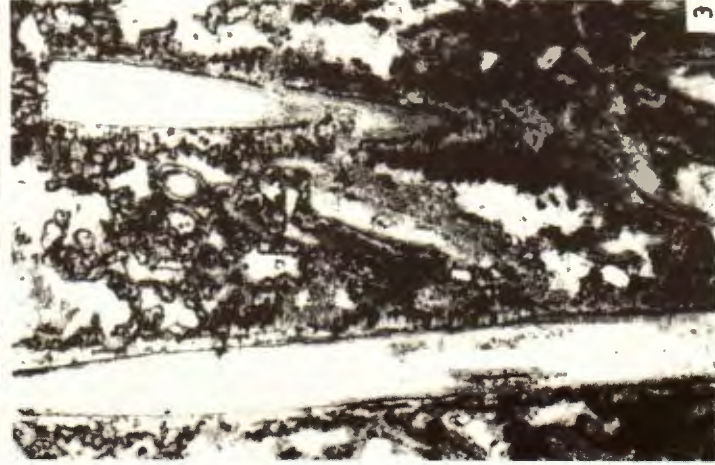
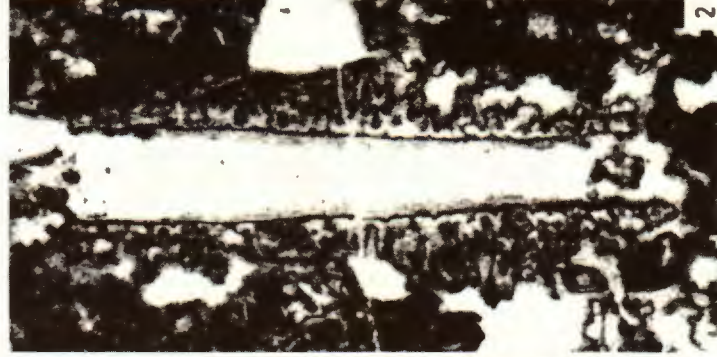
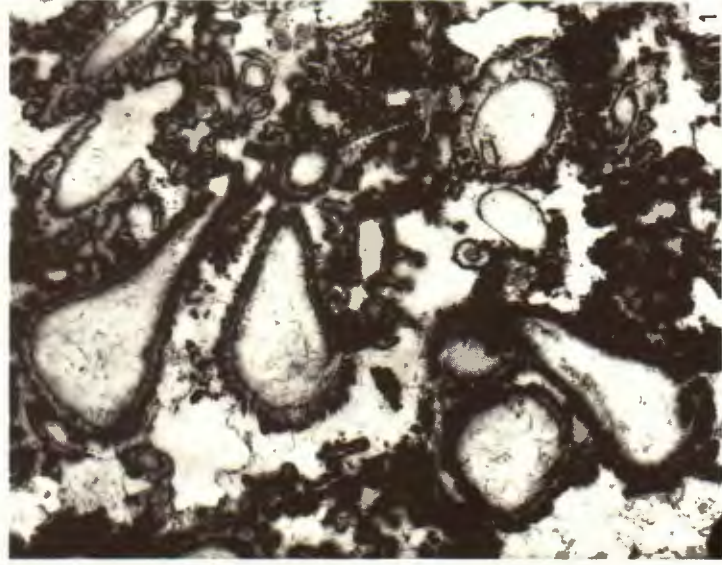


PLATE — TABLA XI

1—8. *Humiella? pupnatensis* n. sp.

1. Oblique section — Holotype (kosi presjek — holotip); × 64
- 2—3. Oblique sections (kosi presjeci); × 25
- 4—5. Tangential — longitudinal sections (tangencijalno-uzdužni presjeci); × 25
6. Longitudinal section (uzdužni presjek); × 25
- 7—8. Oblique sections (kosi presjeci); × 25

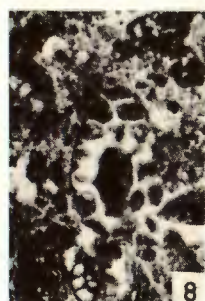
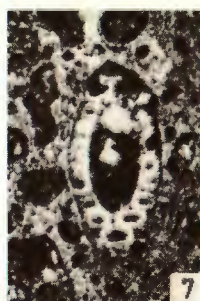
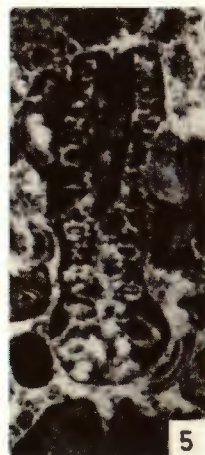
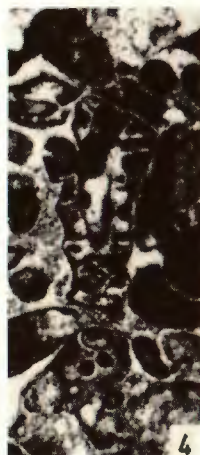
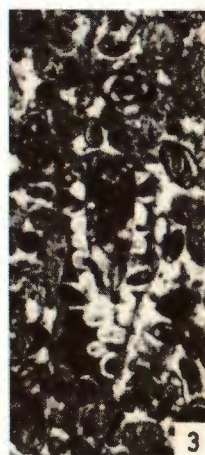


PLATE — TABLA XII

1—8. *Humiella ? pupnatensis* n. sp.

- 1—2. Tangential — oblique sections (tangencijalno-kosi presjeci); × 34
3. Longitudinal section (uzdužni presjek); × 43
4. Oblique sections (kosi presjeci); × 34
- 5, 7. Cross sections (poprečni presjeci); × 43
6. Oblique section (kosi presjek); × 43
8. A Cross section (poprečni presjek)  
B Longitudinal section (uzdužni presjek); × 43

