EARLY CRETACEOUS ALGAE OF ALIMAN (SOUTH DOBROGEA): A REVISION AND DESCRIPTION OF TWO NEW SPECIES FROM EAST CARPATHIANS

OVIDIU DRAGASTAN

Abstract. A new stratinomic Early Cretaceous profile was studied in the Vederoasa - Aliman area (South Dobrogea). The profile included the Cernavoda Formation (Aliman Member and Vederoasa Member) - Late Valanginian - Hauterivian and the Ostrov Formation (Adâncata Member) - Early Barremian in age. The Early Cretaceous sequence provided a rich microflora of algae, especially in the Hauterivian deposits. Some of the new taxa of dasycladaceans recorded by the author in 1978 are re-described. Other taxa such as *Teutloporella filiformis* DRAGASTAN and *Permocalculus discoideus* DRAGASTAN, 1989 are transferred to the genus *Pseudopenicillus* DRAGASTAN et al., 1997. Two new Hauterivian dasycladacean algae are introduced: *Bancilaporella* n. g. and *Vederosella* n. g. from Aliman and *Rajkaella alpina* n. sp., *Hedstroemia* n. sp. (Berriasian-Valanginian) from East Carpathians.

Keywords: New taxa, calcareous algae, dasycladaceans, udoteaceans and pseudoudoteaceans.

INTRODUCTION

The calcareous succession outcropping in the old quarry from the Vederoasa Valley, near Aliman (South Dobrogea, Fig. 1), has been well studied during the last years by Neagu, Pana & Dragastan (1977), Dragastan (1978), Neagu & Dragastan (1984) and Dragastan et al. (1998).

The sequence consists of zoogenous, muddy calcarenite interbedded with coquina-limestone and clay or clay-marly limestone. The macrofauna is dominated by sponges, pelecypods, gastropods and subsequently by brachiopods. The microfauna, represented mainly by benthiic foraminifers, is rich and extremely diverse, and so is the microflora, including cyanophyceans and green algae (dasycladaceans, udoteaceans and pseudoudoteaceans).

LITHO- AND BIOSTRATIGRAPHY OF THE EARLY CRETACEOUS SECTION AT ALIMAN

The Early Cretaceous deposits in the Aliman quarry belong to the Cernavoda Formation, i.e. to the uppermost part of the Aliman Member (Late Valanginian) and to the Vederossa Member (Hauterivian), being transgressively overlain by the Ostrov Formation, Adâncata Member, Early Barremian in age (Dragastan, Neagu, Barbulescu & Pana, 1998).

The Upper Valanginian sequence begins with oosparitic limestone followed by pelmicrite and micrite limestone interbedded sometimes with very thin layers of clay and clays with calcareous nodules 1-2 cm in diameter (Fig. 2). A breccia level formed by bioclasts, broken shells of pelecypods (mainly oysters), gastropods and rarely sponges occurs at the terminal part of the sequence. The breccia level is overlain by icrite and marly-limestone pierced by *Gastrochaenolites* pholiadits pointing to a transitional facies from distal-intertidal to proximal-subtidal environment. The last sequence of the Valanginian is represented by marly-limestone and clay rich in micro-fauna and flora.

Two massive reef-limestones (R3, R4) are built by dome-colonies of Demosponges as “core” reefs of *Axiparietes tremulus*, *Granatiparietes simionescui*, *G. communis*, *Actinostromaria coacta*. Around the core-reefs gastropods (*Nerinea, Leviathania, Natica*), ostreids and pholadomyids accumulated.

The microfossils, *Meandrospira favrei*, *Nautiloculina cretacea*, *N. broennimanni*, *Haplophragmoids joukowski*, *Bancilina rumana* (Foraminifers) and *Clypeina radici*, *Salpingoporella annulata*, *Pseudopenicillus discoideus* and *Rivularia piae* (Algae), indicate a Late Valanginian age.

The *Clypeina radici* biozone, first time created for the Valanginian deposits of the Cernavoda profile, displays a maximum richness of specimens. If was also found in the Aliman section and is regarded as a regional-marker of Late Valanginian for South Dobrogea (Fig. 2).

The Hauterivian is represented by a thin, transgressive unit of 8-10 m. It overlays the Aliman Member and was recorded on both sides of the Vederoasa lake, the type section of the Vederoa Member. Its upper boundary is erosional, being unconformably covered by the Adâncata Member (Early Barremian) of the Ostrov Formation.

University of Bucharest, Faculty of Geology and Geophysics, Laboratory of Paleontology, Bd. N. Balcescu 1, 70111, Bucharest, Romania
Figure 2 - Stratigraphical range of some revised and new taxa of calcareous algae from the Aliman profile (South Dobrogea)
The succession includes from bottom to top yellow-red clays with calcareous nodules, oosparite and pelmicrite interbedded with marly-limestone, micrite and varigated clay levels.

Towards the basal part of the sequence, a patch-reef (R5) built by Demosponges, containing Actinostromaria orthogonalis, Steineria tabulata and Tosastrama magna is characteristic for the Vederosa Member.

The Hauterivian age was established by the assemblage with Praturlonella insignis, Supplilumella almani, S. eritiougelei, Megaporella fluegeli, Vederosella almani n.g., n.sp. (Algae) and by Meyendorfina jordanensis, Scythiculina confusa, S. bancilai, Rumanoloculina massei, Moesioculina dobrogiaca, Pfenidierina conica and P. globosa (Foraminifers). Bicaziella jurassica, a rare pseudodolutean alga for the Hauterivian was found.

Chronostratigraphically, the Hauterivian of Aliman is representative for algal diversity, especially dasycladaceans marked by Megaporella fluegeli - Bancilaporella filipescui biozone. The diversity of dasycladacean species is an evolutive event marked by the increase of taxa number related to the Hauterivian transgressive phase. The Early/Late Hauterivian boundary is also well marked by the dasycladacean “explosion” (Masse, 1993).

The Early Barremian Adâncata Member of the Ostrov Formation represents a transgressive and discordant sequence a few meters thick (5 m) overlaying the Hauterivian. The sequence begins with yellow-red indurate clays, pelsparite and oosparite. A small patch-reef (R6) was built by Chaetotopsis crinita, Ch. zonata and Varioparietes lamellulosus followed by a coquina-ticket bafflestone of Reginia ammania and P. renevieri (P1).

To the top of the profile, the sequence continues with yellow-reddish micritic and pelmicritic limestone, rich in Cuneolina hensoni, Derventina filipescui, Rumanoloculina robusta, Salpingoporella carpathica, Clypeina valachia and Cylindroporella barbui.

The biozone with Salpingoporella muehelbergii was separated in the sequence of Early Barremian, fact which confirming the age of this assemblage assigned before by Masse (1976) and Conrad & Peybernès (1976).

PALEOALGOLOGICAL DESCRIPTION

Systematics adapted from Berger & Kaever, 1992.

Phylum CHLOROPHYTA
Class CHLOROPHYCEAE
Order DASYCLADES
Family TRIPLOPORELLACEAE (Pia, 1920)
Genus PRATURLONELLA Barattolo, 1978 emend., Dragastan now
Praturlonella insignis (Dragastan, 1989, non 1978) (Pl. 1, Figs. 1-6)

Lectotypification in 1989 from the original paper, p. 110, fig. 1h; 1978 Likanella insignis n. sp.; Dragastan, p. 122, fig. 1 h-l, Pl. III, fig. 10; Pl. VI, fig. 1; Pl. VIII, fig. 4; non Radoicicella subtilis, Pl. II, fig. 6, 12; non Goniolina minima, Pl. III, fig. 3.

Paratypes: Pl. I, Figs. 3-6, Hauterivian, Samples 87, 84, 54, 28 (maximum of specimens), Coll. LPB V No. 1078; No. 1079; No. 1080; No. 1081.

Diagnosis: Thallus consisting of calcareous, discoidal-shaped "segments" (sensu Sokac, 1996) crossed by a large axial hollow bearing 3 rows of a special phloophorous ramifications.

The ramifications present a special shape of phloophorous, narrow to the proximal part and opened like a trumpet from the middle to the distal part (Pl. I, fig. 1).

The ramifications disposed in verticils tightly compressed correspond to rows or rings (Sokac, 1996).

Description: Thallus composed of calcareous discoidal shaped “segments” separated by weakly calcified intervals. The discoidal “segments” are crossed by a large axial hollow, each “segment” bearing 3 rows of ramifications. The “rings” show one type of ramification: phloophorous primordium. The shape of ramifications, narrow and middle-distal parts very open, like a trumpet (Pl. 1. Figs. 1, 6). In the partial, longitudinal section the phloophorous ramifications are clearly visible.

Dimension in mm.: Height of “segment” (H)=0.90-1.40; diameter of thallus “segment” (D)=1.12-1.30; diameter of central cavity (d)=0.24-0.40; length of ramifications (l)=0.14-0.30; proximal diameter of ramification (dp)=0.050-0.055; distal diameter of ramifications (dd)=0.060-0.10; number of horizontal rows per “segment” (w)=3; number of ramifications per “segment” (ws)=12-16x3=36-48.

Remarks: Praturlonella insignis (Dragastan, 1989, non 1978) is comparable by the number of rows of ramifications per “segment” with P. neræ (Dragastan et al., 1978), but differs from it by the large size of the thallus- “segment” and by the shape of ramifications. A revision of Praturlonella species was presented by Sokac (1996). In this revision Sokac transferred some species to the genus Praturlonella, such as P. danilovae (Radoicic, 1968), P. pejovicae (Radoicic, 1969), P. adriatica (Sokac & Velic, 1978), P. jordanica (Kuss & Conrad, 1991). P. danilovae and P. pejovicae differs from Praturlonella insignis by a reduced number of rows of ramifications, (only 2) and by other dimensional parameters. As compared to P. adriatica and P. jordanica, the differences lie in number of rows of ramifications (3-4, or 4) and other dimensional data (see Table 6 from Sokac, 1996). In my opinion, the exact number of ramifications per “segment” is difficult to count in thin sections, but this is possible in detachable “segments”. If we compare the original diagnosis of genus Draconisella Granier & Michaud, 1989 ( D. genotii, Portlandian of Chiapas) “pearl neak- lace thallus consisting of several large ring –shaped segments bearing at least three whorls of branches each. Primary branches thickening toward the outer ends and proximal narrowing”, differs by genus Praturlonella Barattolo, 1978 only by shape of segments being identical by the shape of branches disposed in verticils.

Moreover, another taxon Milanovicella Granier & Berthou, 1994 has the same character, presence of 2 verticils per segment being identical as construction with genus Praturlonella.

In my opinion the genera Draconisella and Milanovicella are junior synonyms of genus Praturlonella.

The genus Praturlonella Barattolo consists of ring-shaped-segments alternating with weakly calcified intervals, bearing phloophorous ramifications disposed in verticils. To the original descriptions of this genus we added that the number of verticils or rows is variable between 2 until 5-6 per segments. The shape of segments also variable, discoidal to pearl- neck lace, having per segment 2-6 verticils or rows.

To describe new taxa (genera), taking into account, only the shape of segments and the shape of
ramifications which is phloiophorous for all "taxa" and the number of verticils per segment isn't sufficient for a such a rank. From this point of view the use of genus \textit{Praturlonella} is recommended, the splitting of this is not useful.

\textit{Praturlonella emilii} n. sp.

\begin{itemize}
  \item 1978 \textit{Likanella insignis} n. sp.; Dragastan, Pl. VIII, fig. 3
  \item Derivation nominis: Species dedicated to my geologist colleague, Prof. Emil Constantinescu from the Department of Mineralogy, University of Bucharest.
  \item Holotype: Pl. 1, Fig. 11, Late Valanginian, Sample 122, Aliman, Coll. LPB V No. 1082.
  \item Isotypes: Pl. 1, Figs. 7-10, 12, Late Valanginian, Samples 130, 112, 122, Aliman, Coll. LPB V No. 1083, No. 1084 and No. 1085.
\end{itemize}

Diagnosis: Thallus formed by strongly calcified discoidal "segments" crossed axially by a small cavity. The discoidal "segments" bear 5-(6) rows of phloiophorous ramifications.

Description: Thallus made up of strongly calcified discoidal "segments" crossed by a small axial cavity. In profile the discoidal "segments" flat in their middle part and acuminata to both margins (Pl. 1, Figs. 7, 8, 11). Each discoidal "segment" has 5 (or 6) rows of ramifications; the upper and lower rows with a reduced number of ramifications (8), the intermediary rows having 10-12 ramifications and the central row the maximum number of ramifications, 14-16. The ramifications disposed regularly in rows, in an alternating manner, are also compressed against each-other (Pl. 1, Fig. 10). The ramifications phloiophorous have a narrow proximal part and acuminate to both margins (Pl. 1, Figs. 7, 8, 11). Each discoidal "segment" has 5 (or 6) rows of ramifications. The verticils euspondyle provided small, bead-like disposition and the ramifications arranged in same intervals inflated areas separated by narrow zones. The verticils cross the ramification salpingoporelliform ramifications wide zones. The verticils, which do not have a typical stellate disposition, and by a constant number of ramifications (9-11). \textit{C. radici} Sokac (Neocomian) has also a small verticil, a variable number of ramifications (7-14) and another shape of ramifications; \textit{C. nigra} Conrad & Peybernès (Barremian) has very small verticils and a high number of ramifications per verticil (18-20) (Conrad & Peybernès, 1978) ; \textit{C. onogosti} Radoicic (Barremian) is different by the shape of ramifications and a constant number of ramifications, 15 (see Table 1, p. 55 from paper of Radoicic). \textit{C. pastinki} Radoicic (Late Cenomanian-Turonian) (Radoicic, 1986) has a small verticil diameter and only 8-10 ramifications, unlike \textit{C. valachia}.

\textbf{BANCILAPORELLA n. gen.}

Derivatio nominis: Genus dedicated to Academician Prof. Ion Bancila, a personality of Romanian Geology.

Type genus: \textit{Bancilaporella filipesculi} (Dragastan, 1989) former \textit{Neomizzia filipesculi} Dragastan, 1989.

Diagnosis: Thallus small, cylindrical having at the same intervals inflated areas separated by narrow zones. The verticils euspondyde provided small, phloiophorous salpingoporelliform ramifications wide opened distally.

Remarks: The new genus can be compared by the shape of ramifications to genus \textit{Salpingoporella} Pia, 1918, from which it differs by the "moniliformous" shape of its thallus.

The genus \textit{Neomizzi} Levy, 1966 (Carixian-Domerian) is an articulate, segmented dasyclad with a bead-like disposition and the ramifications arranged in verticils, the ramifications short and widely opened distally, having a different morphology from that of the genus \textit{Bancilaporella} n. gen.

The taxon \textit{Neomizzi} elongata considered by Granier & Deloffre (1994) as nomen nudum was validated by Bucur (in press), who introduced a lectotype and by a constant number of ramifications (9-11). \textit{C. radici} Sokac (Neocomian) has also a small verticil, a variable number of ramifications (7-14) and another shape of ramifications; \textit{C. nigra} Conrad & Peybernès (Barremian) has very small verticils and a high number of ramifications per verticil (18-20) (Conrad & Peybernès, 1978) ; \textit{C. onogosti} Radoicic (Barremian) is different by the shape of ramifications and a constant number of ramifications, 15 (see Table 1, p. 55 from paper of Radoicic). \textit{C. pastinki} Radoicic (Late Cenomanian-Turonian) (Radoicic, 1986) has a small verticil diameter and only 8-10 ramifications, unlike \textit{C. valachia}.
Diagnosis: Thallus cylindrical-moniliform crossed by a large axial-cavity. Thallus presents inflated areas separated by narrow zones. No segmentation of thallus was observed. Verticils euspondyly provided only primary, phloiophorous salpingoporelliform ramifications.

Description: Thallus small in size, long, cylindrical-moniliform with a large axial siphon. Thallus displays inflated areas at equal intervals separated by narrow zones. The verticils euspondyly are formed by phloiophorous, conical, small, short salpingoporelliform ramifications, wide opened distally (Pl. 2, figs. 11-13). In the cross section the thallus is round in outline and the verticils have a reduced number of phloiophorous and salpingoporelliform ramifications (Pl. 2, fig. 5).

Dimensions in mm.: Length of thallus (L)=1.40-1.58; diameter of inflated area (Di)=0.40-0.50; diameter of the narrow zone (Dn)=0.14-0.36; length of ramifications (lr)=0.075-0.095; diameter of ramifications: proximal=0.024-0.030 and distal=0.048-0.062; w=8(10).

Remarks: Initially it was assigned to the genus Neomiella, but N. elongata Levie has a clearly segmented thallus, each bead being separated along the thallus, and it is different from Banciloporella filipescui. Comparing with some Salpingoporella species such as S. annulata, S. ubaiydi, S. katzeri, S. urladanasi (especially cross sections), S. biokovenisis, S. piniae and S. polygonais (see Sokac, 1996), the only morphological feature resembling to B. filipescui is the phloiophorous, salpingoporelliform ramifications.

Genus CYLINDROPORELLA Johnson, 1954

Cylindroporella barbuii Dragastan, 1989

Type genus: Vederosella

Paratypes: Pl. 2, figs. 16-17, Aptian, Camenita Valley, Banat, Coll. LPB V No. 1120; No. 1121.

Description: Thallus cylindrical crossed by a narrow axial siphon. The euspondyly verticils disposed in alternation; the fertile ramifications sphaerical or almost sphaerical, in alternation with infertile cylindrical-tubular ramifications. The infertiles are very small and sometime have at both terminal parts (proximal and distal) a large diameter in comparison with the middle part; from this point of view they are characteristic.

Dimensions in mm.: L=2.40-2.80; D=0.55-0.91 (frequently 0.60); d=0.15-0.20; diameter of fertile ramifications (df)=0.14-0.21; diameter of infertile ramifications (din)=0.024-0.030 (0.050-0.060 diameter to the terminal parts, proximal and distal); length of infertile ramifications (li)=0.024-0.030; w=8.

Remarks: When compared to C. arabica, C. sugdeni, C. barnesii, C. eliassonos , Cylindroporella barbuii, differs from these species by the constant number of fertile and sterile ramifications (8), disposed clearly in an alternating manner. It is very close in diameter of fertile ramifications to C. arabica, C. barnesii, C. kochanskyae and with C. sp.1, Masse & Poignant, 1972.

Comparing with genus Bakalovella Bucur, 1993, (B. benizarenis and B. elitzae), with a cylindrical thallus also, which has primary and secondary ramifications alternating in the adjacent whorls; the primary presents a tubular ramifications continued on the upper side, to a big-subsphercic, fertile ampoules and on the lower side, under ampoules, to the secondary, tubular ramifications widening distally. The structure of species of genus Bakalovella differ totally from the Cylindroporella barbuii (see description of Bakalovella elitzae in this paper).

In 1994 Granier et al. introduced the genus Otternstella as a new combination for Cylindroporella lemmensis Bernier and for other Heteroporella species. In my opinion, there is no difference between the diagnosis of the new genus and the diagnosis of genus Cylindroporella. Moreover, Figure 2, (p.133) is meant to clearly show the difference between the taxa, but in the axial sections, the disposition of ramifications in both genera is identical. In the tangential sections the arrangement between fertile and infertile ramifications could be different. Moreover, in thin sections and also in various figured taxa such as Cylindroporella lemmensis, Heteroporella fourcadei, H. bifurcata or H. jaffrezoii this distinctive feature can not be observed. In my opinion, recognizing the genus Otternstella remains a very difficult problem.

Although Heteroporella lemoinei Dragastan had a lectotype designated in 1989 from the original paper, but due to a printing mistake appeared as "holotype". I make now the correction for all species lectotypified in 1989 to become valid.

Genus BAKALOVELLA Bucur, 1993

Bakalovella elitzae (Bakalova, 1978)

Pl. 2, Figs. 16-17.


Paratypes: Pl. 2, figs. 16-17, Aptian, Camenita Valley, Banat, Coll. LPB V No. 1120; No. 1121.

Description: Thallus cylindrical crossed by an axial cavity with slightly moniliform outline. Primary and secondary ramifications, alternating in adjacent whorls. To the terminal part, the tubular primary, ramifications give rise, on the upper side to a big subspheric fertile ampoules. The tubular secondary, ramifications widen distally.

Dimensions in mm.: D=0.51-1.10; d=0.12-0.28; df=0.18-0.26; din=0.080-0.090; li=fertile=0.10-0.15; lin=0.20-0.23; w=8.

VEDEROSELLA n. gen.

Derivatio nominis: from Vederoasa Valley, Aliman, South Dobrogea.

Type genus: Vederosella alimani n. gen. n. sp.

Diagnosis: Thallus cylindrical and conical to the base crossed by a very narrow axial siphon. The ramifications disposed in verticils having an alternating and helicoidal arrangement. The ramifications only primary, spherical in shape. They have a long proximal tubular peduncle disposed in a sharp angle against the axis (Pl. 3, fig. 10). The thallus presents a clear calcareous “sheath” or muff. The ramifications show, also in between, small connective-laterals like a “communicative siphon”.

Remarks: The Vederosella n. gen. can be compared with genus Cylindroporella, having only primary spherical ramifications, but the new taxon has no fertile ones and a long peduncle of the primary ramifications. A very close structure is shown by the genus Sarfatiella which could be a valid taxon and is not synonymous with genus Holosporella Pia (opinion of Elliott, 1983).

I also believe that the genus Sarfatiella is a valid taxon , which presents only primary, spherical ramifications, but with a short, proximal peduncle perpendicularly disposed on the axis (see fig. 4, p. 303
and and (fig. 2, from the original paper, Conrad & Peybernès, 1973). The genus Holosporella Pia, has also spherical cavities or cyst, but the insertion to the main axis is without peduncle, being in direct connexion with the main cavity; the taxon was included by Berger & Kaever (1992) in the tribe Aciculelleae. All these comparable taxa have another inner morphology of thalli, Vederosella n. gen. being different in spite of “first sight similarities”. To the Recent genus Chalmasia only the presence of connective-laterals is similar with the new taxon.

Vederosella alimani n. sp.

Pl. 3, Figs. 1-10.


Derivatio nominis: “alimani” from the main quarry of Aliman village, South Dobrogea.

Holotype: Pl. 3, fig. 1, Late Hauterivian, Sample 26, Aliman quarry, Coll. LPB V No. 1099.

Isotypes: Pl. 3, figs. 2-9, Late Hauterivian, Samples 30, 32, 33, Aliman quarry, Coll. LPB V No. 1100; No. 1101; No. 1102; No. 1104; No. 1105; No. 1106; No. 1107.

Diagnosis: Thallus small, cylindrical at both ends, slightly conical, crossed by a very narrow axial siphon. The verticils euspondyly made up only of primary, spherical-globulous ramifications. The ramifications have in the proximal part, a long tubular, peduncle set at an acute angle to the axial siphon (Pl. 3, fig 1- see arrow, fig. 10). The distal part is spherical-globulous. The ramifications have an alternating, helicospherical disposition in quadruple manner (4=4), being visible in Pl. 3, fig. 5 (see arrows). In axial-longitudinal sections, the ramifications show clearly the long peduncle (proximal), continued distally with a large spherical-globulous part. Sometimes compressed against each-other, like in a compact structure. The ramifications are more or less covered by a “muff” of microcrystalline or coarsely crystalline calcite (Pl. 3, figs. 6, 8).

Dimensions in mm.: Length of primary ramifications - 0.35-0.50; diameter of proximal ramifications - 0.080-0.10; diameter of proximal, ovoidal-swelling - 0.12-0.14; Length of secondary ramifications - 0.050-0.070; w2 - 6.

Remarks: At first sight Vederosella alimani n. sp. can be compared only by the same spherical shape of ramifications with some species of genus Cylindroporella, such as C. barnesii (Pl. 7, fig. 2 from Bassoulet et al., 1978) and with C. elassonos (Pl. 7, fig. 5 from Bassoulet et al., 1978), being homeomorphic but not indentical. C. taurica has a large thallus with fertile and infertile ramifications (Conrad & Varol, 1990). The new species differs from them due to the lack of tubular infertile ramifications and the presence of long peduncle in the proximal part of the spherical branches. Sarfatieilla dubari, which I consider as a valid taxon, is comparable in respect to the shape of ramifications, spherical or subspherical, but it has a short cylindrical peduncle disposed perpendicularly to the axial siphon (see the original reconstruction, p. 303, fig. 4 from Conrad & Peybernès, 1973). To the Recent Chalmasia antillana the comparison included the presence of lateral connexions between ramifications. The function is to communicate laterally between ramifications by these “small bridge siphons”, as in the new taxon.

Genus RAJKAELLA Dragastan & Bucur, 1988

Rajkaella alpina n. sp.

Pl. 2, Figs. 18-19.

Holotype: Pl. 2, fig. 18, Berriasian, Ghilcos Massif, Bicaz Gorges, East Carpathians, Coll. LPB V No. 1108.

Isotype: Pl. 2, fig. 19, Late Valanginian, Ghilcos Massif, Bicaz Gorges, East Carpathians, Coll. LPB V No. 1108.

Diagnosis: Thallus made up of verticils with primary and secondary ramifications, in many cases dismemembered. The primary ramifications long, cylindrical have an ovoidal shape in the proximal part, like a swelling for the insertion to the main axial siphon. To the distal end continued with the secondary ramifications, short, ovoidal elipsoidal opened distally and disposed like in a “bush”.

Description: Disarticulated thallus verticils made up by primary and secondary ramifications, the last ones disposed like in a “bush”. The primary ramifications long, cylindrical having in the proximal part an ovoidal-swelling in direct connection with the main axial siphon. The secondary ramifications short, ovoidal-elongate opened distally; they form a bush with 6 ramifications. In the cross section, it is possible to see the 6, ovoidal in shape, secondary ramifications. (Pl. 2, fig. 19).

Dimensions in mm.: Length of primary ramifications - 0.35-0.50; diameter of primary ramifications - 0.080-0.10; diameter of proximal, ovoidal-swelling - 0.12-0.14; Length of secondary ramifications - 0.050-0.070; w2 - 6.

Remarks: Rajkaella alpina n. sp. is a small alga, which is close to R. subtilis by the shape of primary ramifications. R. subtilis has no proximal ovoidal-swelling, but the same “petaloid” disposition of secondaries with a reduce number of ramifications, in a “bush” (Dragastan, 1999). By the shape and dimensions of primary and secondary ramifications, the new taxon differs from R. alimani, R. minima, R. bartheli and also from the large species such as R. laskarevi and R. banatica (Dragastan & Bucur, 1993).

Class BRYOPSIDOPHYCEAE
Order BRYOPSIDALES
Family UDOTEACEAE

Genus PSEUDOPENICILLUS Dragastan et al., 1997

Pseudopenicillus filiformis (Dragastan, 1989, non 1978)

Pl. 4, fig. 10.

Lectotypification in 1989 from the original paper, Pl. IV, fig. 1, Coll. LPB V No. 0050 (Dragastan, 1989a, 1995).

1979 Teudoporella filiformis n. sp.; Dragastan, p. 122, Pl. IV, fig. 1-2.

Paratype: Pl. 4, fig. 10, Hauterivian, Sample 2/10/95, Aliman, South Dobrogea, Coll. LPB V No. 1110.

Description: Thallus cylindrical crossed by a large medullar zone without preserving the medullar siphons. Thallus has a thick cortex, strongly calcified. The thallus presents slightly constrictions sometimes deeply inserted in the cortex. No data about the medullar siphons. The cortex system is composed of long,
tubular, primary siphons, continued by short, secondary dichotomously branched siphons and finally by tertiary very short, tubular dichotomously branched siphons (fig. 4).

Figure 4 - Pseudopenicillus filiformis (Dragastan, 1989), reconstruction of cortex branched siphons system

Dimensions in mm.: L=6.0-10.0; D=2.40-2.70; diameter of medullar zone (dm)=0.96-1.20; cortex system: diameter of primary siphons (dcs1)=0.048-0.052; diameter of secondary siphons (dcs2)=0.012-0.020; diameter of tertiary siphons (dcs3)=0.060-0.080; length of primary siphons (lcs1)=0.15-0.20; length of secondary siphons (lcs2)=0.020; diameter of tertiary siphons (lcs3)=0.020-0.025.

Remarks: Pseudopenicillus discoideus is a different taxon due to its bead shaped segments. It differs from P.filiformis and of P. aegaeicus, which have cylindrical segments in a cortex system with 3 or 4 orders of branched siphons.

The taxa "Arabicodium" jurassicum, "A." elongatus, "A." orientalis, "A." texana, "Permocalculus" dragastani, "Permocalculus" sp. in Dragastan (1989) and Halimeda sp. sensu Okla (1992) show an empty medullar zone, variable in size and a multibranched cortex system (until 4 orders) different from P. discoideus.

Family PSEUDOUDOTEACEAE
Ancestral ecorticatae
Genus HEDSTROEMIA Rothpletz, 1913
Hedstroemia n. sp.
Pl. 4, Fig. 9.
Specimen: Pl. 4, fig. 9, Valanginian, Sample 470, Ghilcos Massif, Bicaz Gorges, East Carpathians, Coll. LPB V No. 1118.

Description: Thallus hemispherical crossed by multibranched siphons (Pl. 4, fig. 9 - see arrows). The siphons system consists of short, main tubular siphons, which continued with a polytomic branched siphons. The polytomic siphons in number of 6, symmetrical disposed against the main siphons, growing in diameter to the distal part.

Dimension in mm.: Width of thallus - 1.56; high of thallus - 1.80; diameter of the main siphon - 0.072; diameter of the polytomic branched siphons: in the proximal - 0.032, in the distal - 0.084.

Partial Corticatae
Tribe BICAZIELLEAE Dragastan, in press
Genus BICAZIELLA Dragastan, 1988
nomen correctum
Bicaziella jurassica Dragastan, 1988
Pl. 4, Fig. 11.

Paratype: Pl. 4, fig. 11, Late Hauterivian, Sample 26, Aliman, South Dobrogea, Coll. LPB V No. 1119.

Description: Thallus fan-like having small lobes disposed laterally. It is crossed by 2 kinds of siphons: V-shaped, tubular siphons (Pl. 4, fig. 11-see arrows) and trichotomic siphons branched after an angle of 90°, disposed in the different part of the thallus (Pl. 4, fig. 11-see arrows). Diameter of the tubular siphons is the same, indifferent of kind of branching.

Dimensions in mm.: Width of thallus - 4.10-4.20; height of thallus - 5.80-6.0; diameter of branched siphons - 0.048-0.060.

Remarks: This species was reported as being frequently from the Tithonian in the Carpathian carbonate platforms and rarely in the Neoconian (Hauterivian deposits) of South Dobrogea.
REFERENCES


PLATES

PLATE I

Figs. 1-6. Praturlonella insignis (Dragastan, 1989, non 1978): 1-2. reconstruction of thallus; 3-4. discoidal groups of verticils with 3 rows of ramifications; 5. broken discoidal groups of verticils with visible upper and middle rows of ramifications; 6. partial vertical section in broken discoidal groups of verticils with 3 rows of ramifications, Hauterivian, Samples 87, 54, 26.

Figs. 7-12. Praturlonella emilli n. sp.: 7-8. reconstruction of discoidal groups of verticils (lateral and upper views); 11. Holotype, entire discoidal groups of verticils, Latest Valanginian, Sample 122, Coll. L.P.B.V. No. 1082; 12. Isotype, Latest Valanginian, Sample 130, Coll. L.P.B.V. No. 1083; 9. Isotype, partial section in a discoidal - groups of ramifications (left) and cross section trough the ramifications (right), Latest Valanginian, Sample 112, Coll. L.P.B.V. No. 1084; 10. Isotype, tangential section in a discoidal groups of ramifications, Latest Valanginian, Sample 122, Coll. L.P.B.V. No. 1085.


Fig. 19. Salpingoporella annulata Carozzi, vertical section in a polished thallus (see arrow for ramification), Latest Valanginian, Sample 146.

All figures, x 23 (except Figs. 1-2), Aliman, South Dobrogea.

PLATE II

Figs. 1-13. Bancitaporella filipescui (Dragastan, 1989) Dragastan, Hauterivian, Samples 68, 67, 26. 1-5. reconstruction of thallus and different oriented sections from the original paper, 1978; 6-10. entire thalli showing inflate area separated by constrictions, see the euspondyle disposition of ramifications (6, 8); 11-13. various longitudinal axial sections in the thalli; Aliman, South Dobrogea.


Figs. 16-17. Bakalovella elitzae (Bakalova, 1978) Bucur, oblique and cross sections, Latest Barremian, Camenita Valley (Sasca), Banat.


Figs. 1-5. (not to scale); Figs. 6-19., x 24.

PLATE III

Figs. 1-10. Vederosella alimani n. g. n. sp.; 1. Holotype, Latest Hauterivian, Coll. L.P.B.V. No. 1099, Sample 26, oblique vertical section (see arrow for the peduncular ramification), Aliman, South Dobrogea; 3, 5 (see arrow on both sides for the helicospirul disposition of ramifications); 6. Isotypes, Latest Hauterivian, Samples 30, 32, tangential and axial vertical sections, Coll. L.P.B.V. No. 1101; No. 1103; No. 1104; 2 (see arrow for the bridge between ramifications), 4, 7-9. Isotypes, Latest Hauterivian, Samples 32, 33, 30, cross section and oblique cross sections, Coll. L.P.B.V. No. 1100; No. 1102; No. 1105; No. 1106; No. 1107; 10. Reconstruction of thallus, long peduncular ramifications with alternating and helicospiral disposition.

Figs. 1-2, 7, x 26; Figs. 3-6, 8, x 13.

Fig. 11. Dasycladacean A, vertical axial section, Hauterivian, Sample 35, x 20.

Fig. 12. Chalmasia antillana Solms - Laubach, Recent, part of a cap viewed from above see the connected area between ramifications, from Berger & Kaever, 1992, x 38.

PLATE IV

Figs. 1-7. Pseudopenicillus discoideus (Dragastan, 1989, non 1978), Paratypes: 1. cross section in a bead-segment; 2, 5-6. lateral view of the bead-segment; 3-4. view of the upper part of the bead-segments with empty medullar hollow; 7. cortex system in a polished segment; 1. Late Valanginian, Sample 105, x80; 2-6. Hauterivian, Samples 68, 67, 38, x 22; 7. drawing from the original paper, 1978.

Fig. 8. Rivularia piae (Frollo, 1938) Dragastan, 1985, Paratype, vertical-oblique section, Late Valanginian, Sample 122, Aliman, x 13.

Fig. 9. Hedstroemia n. sp., vertical axial section, Valanginian, Ghilcos Massif, BicazGorges, East Carpathians, Coll. L.P.B.V. No. 1118, x 13.

Fig. 10. Pseudopenicillus filiformis (Dragastan, 1989, non 1978), Paratype, Coll. L.P.B.V. No. 1110, Sample 2/10/95; Hauterivian, Aliman, South Dobrogea, x 13.

Fig. 11. Bicazella jurassica Dragastan, 1988, vertical axial section (see arrow for two kinds of branched siphons); Paratype, Hauterivian, Sample 26/91; L.P.B.V. No. 1119, Aliman, South Dobrogea.

Fig. 12. Hauterivian - microfacies, Aliman quarry, Sample 68, x 13.