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The Albian–Cenomanian Kotroman Formation of Mokra Gora (western Serbia)

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Abstract. Cretaceous deposits in the wider area of Mokra Gora village (western Serbia) were studied previously during basic, thematic mapping and detailed metallogenic investigations. These former studies neither distinguished the clearly defined formations, nor defined the lower rank lithostratigraphic units. The oldest Cretaceous formation in the area of Mokra Gora, the "Basal series", lies above peridotite and serpentinite and below the "Hemipelagic series" (Radoičić 1995, and references therein). This study preliminary defines the "Basal series" as a formation and proposes the lithostratigraphic term "Kotroman Formation". The stratigraphic column of the Kotroman Formation consists of three separate members of lower rank. The ferruginous sandstone and conglomerate of the Kamišna Member occupy the lower part, nodular bedded marly limestone of the Uroševići Member are in the middle part and thin bedded bioclastic limestone of the Jatare Member made up the upper part of the formation. Fossils are represented by sporadic assemblages of mollusks, foraminifers, algae, brackish water charophytes and ostracodes, which indicate an Albian–Cenomanian age of the formation.

Key words: Kotroman Formation, palaeontology, sedimentology, Albian–Cenomanian, Mokra Gora, western Serbia.

Апстракт. Кредне творевине у широј околини Мокре Горе (западна Србија) биле су проучаване током основних геолошких истраживања и детаљних истраживања лежишта минералних сировина. Ниједним од ових истраживања нису дефинисане формације, нити је одређен ранг појединих литостратиграфских јединица. Најстарија кредна формација у околини Мокре Горе, тзв. "Базална серија", лежи преко перидотита и серпентинита, а испод "Хемипелашке серије" (Радоичић 1995). Овом студијом је прелимарно дефинисана "Базална серија", за коју је предложен назив "Формација Котроман" и у којој су издвојена три посебна члана нижег реда. Гвожђевити пешчари и конгломерати члана Камишна заузимају најнижи ниво, кргави кречњаци члана Урошевићи се налазе у средњем нивоу, док је највиши члан представљен танкослојевитим кречњацима и лапорцима члана Јатаре. Фосилна заједница представљена је спорадичним асоцијацијама мекушаца, фораминифера, алги, слатководним харофитама и остракодима, који указују на алб-ценоманску старост формације.

Кључне речи: Формација Котроман, палеонтологија, седиментологија, Алб-ценоман, Мокра Гора, западна Србија.

Introduction

Cretaceous sediments have a limited extent in western and south-western Serbia. However, in the wider area of Mokra Gora, there exist well defined Cretaceous exposures, which have been studied by numerous authors, e.g., Milovanović (1933, *cum. lit.*), Pejović & Radoičić (1971), Radoičić (1995), Banjac (1994) and Dulić (2003). Some detailed mapping of the formations and lower rank units was made during

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basic and thematic geologic investigation. OLUJIĆ & KAROVIĆ (1986) distinguished units of Cenomanian, Cenomanian–Turonian and Senonian age, while MOJSILOVIĆ *et al*. (1978) distinguished Cenomanian–Turonian and Turonian units. JOVANOVIĆ *et al*. (2004) distinguished three well defined and mappable formations: The oldest, so called "Basal Series" of Albian–Cenomanian age, which lies directly over serpentinite or its weathered crust; the middle, "Hemipelagic series" of Cenomanian age (thin bedded marly limestone with pithonellas, rarely heterohelicides, hedbergellas, ammonites, echinoderms and gastropods), and the youngest, shallow water reef formation of Turonian age (massive reef limestone with numerous rudists). A detailed description of the basal part of the succession, with special emphasis on microfauna assemblages, was presented in RADOIČIĆ & SCHLAGINTWEIT (2007). Exposures at Vardište in Bosnia (5 km southwestward from Mokra Gora, Fig. 1), with rocks similar to Basal Series, were object of detailed lithological investigations by BORTOLOTTI *et al*. (1971). Their level 1 and 2 could be correlated with lower part of Kotroman Formation, while their level 3 (with abundant fossil associations), could be correlated with upper part of Kotroman Formation, or with Jatare member as lateral equivalent. On the contrary, the authors refer to Upper Jurassic age of these rocks.

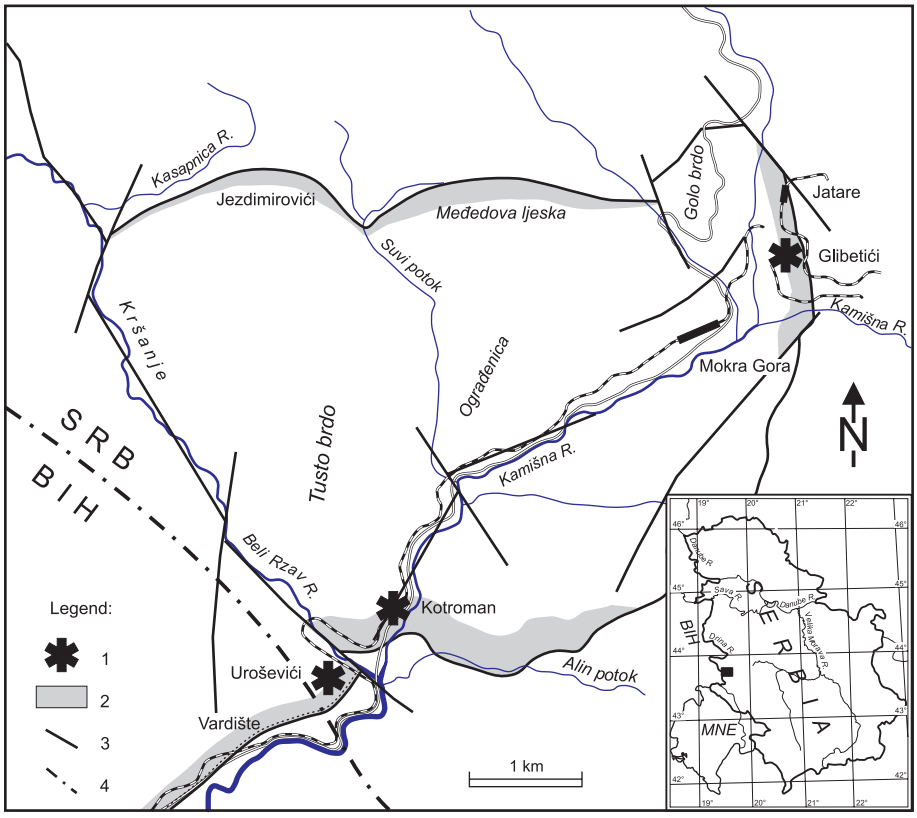

Fig. 1. Distribution of the Kotroman Formation in the Mokra Gora area. Legend: **1,** Position of investigated stratigraphic columns; **2,** Distribution of the Kotroman Formation; **3,** Major faults; **4,** State boundary.

Distribution and main features of the Kotroman Formation ("Basal Series")

The "Basal Series" is best exposed in the close vicinity of the Kotroman village (43°46'3.81'' N, 19°28'22.05'' E), which can be regarded as the type locality (Fig. 1). We propose and define the new lithostratigraphic term "Kotroman Formation" for the former "Basal Series" of JOVANOVIĆ *et al*. (2004). The aforementioned locality by the Kotroman village is adopted as the type section of the Kotroman Formation. Other localities are distributed on the surrounding of Mokra Gora, the Rzav syncline, and include: the Valley of the Beli Rzav River and Kršanje, Vardište, Međedova Ljeska and Jezdimirovići villages. Some limited exposures are present at a larger distance, i.e., Jagoštica, Pozderčić and Ljuto Polje hamlets.

In the western part of the study area, in the Kotroman and Uroševići localities, the Kotroman Formation directly overlies serpentinite, while in the eastern part of the study area it is located over a few meters thick weathering crust. It is of nontronite type with nickel concentrated in a smectite zone. There is relative enrichment of Fe_2O_3 and Al_2O_3 and some trace elements in the uppermost part of the crust MAKSIMOVIĆ (1996). The Kotroman Formation is overlain by the Hemipelagic Series (Formation).

The Kotroman Formation is about 50 m thick and consists of a clastic sequence in the lower part and limestone beds in the upper part of the stratigraphic column. The lower limit is a sharp transgressive boundary with serpentinite or a few meters thick weathering crust, while upper limit is a gradual transition to the Hemipelagic Series.

Three separate members can be distinguished: The Kamišna Member, the Uroševići Member and the Jatare Member, even though the last one can be consider as lateral equivalent of Kotroman Formation.

The Kamišna Member is represented by a clastic sequence consisting of reddish conglomerates and thin-

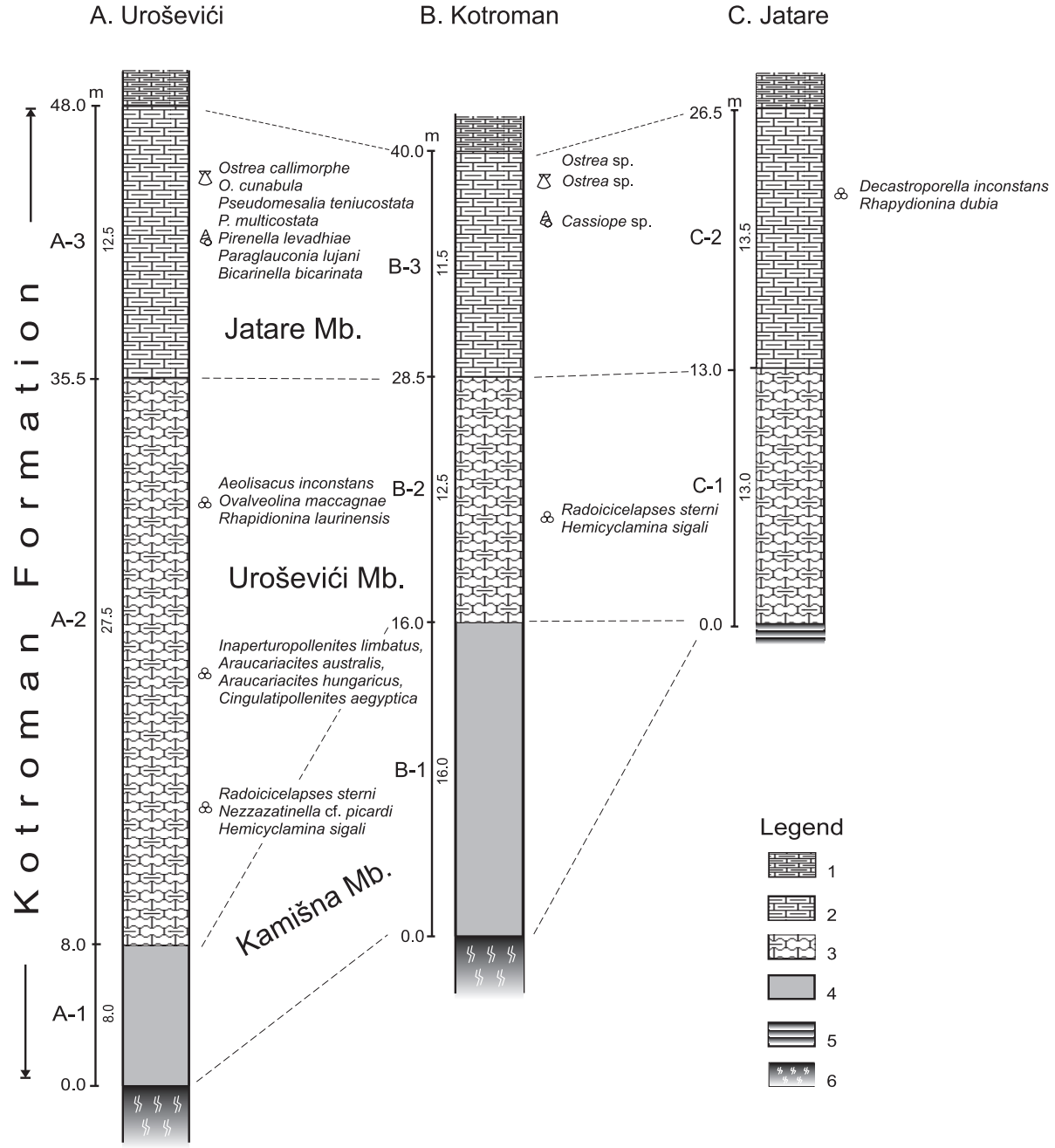

Fig. 2. Simplified stratigraphic columns (A. Uroševići, B. Kotroman, C. Jatare) in which appears the Kotroman Formation. Legend: **1,** "Hemipelagic series"; **2,** bedded limestone intercalated with marlstone (Jatare Member); **3,** nodular gray redish limestone (Uroševići Member); **4,** conglomerate and sandstone (Kamišna Member); **5,** base, weathering crust of ultramafics; **6,** base, altered ultramafics.

bedded oolitic iron-rich sandstones with cherty nodules. The lower segment of the Kotroman Formation is adopted as the type section of the Kamišna Member. This clastic sequence can also be found close to Vardište, at the northern slope of Međedova ljeska and Jezdimirovići. Here, the polymict basal conglomerate is composed of serpentinite, gabbro, chert, diabase and limestone fragments in a sandstone matrix. These conglomerates are interbedded with gradational sandstones. The upper part of the clastic sequence is characterized by red chert and alevrolite. There is a smooth transition to the overlain Uroševići Member. Conglomerates and clastites are increasingly replaced with calcareous fine grained sandy limestone with ostreids, algae and microfauna. An economic potential of the Fe–Ni ore has been reported for the lower part of the clastic sequence (FOTIĆ 1965, JANKOVIĆ 1990).

The middle part of the Kotroman Formation is dominated by nodular limestone of the Uroševići Member, mostly biomicrites, with frequent yellowish marl inter-

calations, as well as macro and microfossils associations. Smooth transition to the upper part of the Kotroman Formation is marked by decreasing thickness of beds and less nodular limestone. Upper segment of Formation, which is represented by thin bedded bioclastic limestone, is here adopted as Jatare Member.

Schematic stratigraphic columns of the Uroševići, Kotroman and Jatare localities are presented in Fig. 2. The Kotroman section is designated as the type section of the formation.

Description of the stratigraphic columns

A – Uroševići

The cumulative thickness of the Kotroman Formation in the Uroševići locality is 48 m. Here, the basal conglomerates of the Kamišna Member (A-1 in Fig. 2) transgressively overlie serpentinite rocks. Iron rich dark green chamosite ooides and serpentinite particles can be frequently found in conglomerate fragments. The grains are cemented with calcareous or clay-ironstone cement. In addition to conglomerates, loose dark gray sandstone predominated in this Member (Fig. 3). Small cherty fragments as well as sand particles of different size are bound by clayey or limonitic red or brown cement. The bedding surfaces in the entire lower Member are not well expressed. Floral remnants, such as fine dispersed plant particles and fragments of branches and tree trunks, are common. In addition, bisect particles of conifers, dominated by *Pinus* and rarely *Podocarpus, Cedrus* can be found.

Fig. 3. Oolitic sandstone of basal part of the Kotroman Formation (Kamišna Member), 250 m north-westward from Beli Rzav and Crni Rzav mouth (43°46'01'' N, 19°28'06'' E).

The Uroševići Member of the stratigraphic column is nodular biomicrite interbedded with yellowish marl (A-2 in Fig. 2). The type section is at the Uroševići hamlet (43°46'1.44'' N, 19°28'7.11'' E). Nodules of floatstone and wackestone are enclosed in an intimate mixture of clay and carbonate. Extremely small crystals of quartz, pyrite and hematite can be found in the clayey matrix. The microfauna assemblage consists of codiacean fragments and *Radoicicelapses sterni*, *Nezzazatinella* cf. *picardi*, *Salpingoporella urladanasi*, *Aeolisacus* sp., *Glomospira* sp. The macrofauna is represented by gastropod fragments (*Cassiope* sp.). Rare oogonias and charophyte trunks represent the microflora association. Also there are frequent inaperturate pollen grains of xerophile conifers (*Inaperturopollenites limbatus, Araucariacites australis, A. hungaricus, Cingulatipollenites aegyptica, Caliallasporites,* rare *Cycadopites, Ephedripites, Steevesiapollenites, Eucommiidites* etc.). A rich assemblage of fern spores can also be found (*Gleicheniaceae, Anemiaceae, Schizaceae, Cyathaceae, Disconiaceae*). Among the angiosperm pollen grains, the most frequent are *Retimonocolpites reticulatus – peroreticulatus* (rarely genera *Clavatipollenites*), as a rich assemblage of the genera *Tricolpites* and *Tricolporoidites*. Rarely triporate pollen grain of normapolles (*Complexiopollis* sp.) can be found.

In the upper part of the Uroševići stratigraphic column (A-3 in Fig. 2), thin bedded nodular bioclastic limestone represents the third, Jatare Member. Calcareous and silty marlstones in some places contain abundant microfauna associations, which are represented by: *Aeolisacus inconstans*, *Ovalveolina maccagnae* and *Rhapidionina laurinensis*. Macrofauna is discovered at numerous localities, sometimes forming coquina beds. Frequently, it is represented by mollusk fragments, bivalves *Amphidonte conicum*, *Ostrea callimorphe*, *O. cunabula*, and gastropods *Pseudomesalia teniucostata*, *P. multicostata*, *Pirenella* cf. *levadhiae*, *Paraglauconia lujani*, *Bicarinella bicarinata* and *Cassiope kotromanensis*. In addition charophyte remnants can be found.

The Jatare Member of the Kotroman Formation is here overlain by bituminous, thin bedded, marly limestone of hemipelagic series. The bedding surfaces of the above series are plain and well expressed.

B – Kotroman

The cumulative thickness of the Kotroman Formation at its type section (Kotroman Village) is 48 m. The stratigraphic column at the Kotroman locality (B-1 in Fig. 2) has a lithology which can be compared with the previous column. Similarly to Uroševići, the lowermost Kamišna Member is transgressive iron rich sandstone. The type section of the Member is at same locality as the Kotroman Formation (43°46'3.81'' N, 19°28'22.05'' E). This Member here is characterized by well rounded pyritized grains and fragments of serpentinite, without any fossils. Subsequently, sediments of the Uroševići Member can be found. It is well bedded sandy reddish nodular limestone with bivalve and gastropod shells

(Figs. 4, 5). These beds contain rare ostracode remnants, gyrogonytes, charophytes, algae *Radiocicelapses* sp., etc. Rarely, cm-scale lenses of calcirudite and calcarenite rich in bio- and lithoclasts, fragments of mollusks, peridotites and siliceous rocks can be found. These are replaced by nodular reddish limestone with rare macrofauna (B-2 in Fig. 2). Above these, thin bedded yellowish biomicrite – wackstone (B-3 in Fig. 2) of the Jatare Member can be found. These beds contain ostracodes, bivalves and the algae fragments. The palynomorph association is similar to that at the Urošević locality.

Fig. 4. Nodular (knobby) limestone of the Urošević Member (43°46'05'' N, 19°28'22''E).

Fig. 5. Limestone with mollusk fragments of the Urošević Member (43°46'05'' N, 19°27'57'' E).

C – Jatare

The cumulative thickness of the Jatare stratigraphic column is 26 m. Here, nodular limestones of the Urošević Member are superimposed on top of a weathered crust. Field observations indicated that no clastic section comparable to that at the Kamišna Member is present. Here, gray and yellowish marly limestone is the dominating lithological constituent of the stratigraphic column (C-1 in Fig. 2). The beds contain mollusk shells with geopetal fillings, foraminifers, ostracodes and rare charophyte remnants. The latter ones indicate intermittent fresh water influx. The uppermost part of the stratigraphic column (C-2 in Fig. 2) is represented by thin bedded marly limestone of the Jatare Member (Fig. 6). The type section of this Member is situated southward of the Jatare Hamlet (43°47'45.60'' N, 19°31'4.45'' E). Numerous foraminifers (Miliolidae, Nezzazatidae, *Glomospira* sp. etc.), ostracodes and cyanobacteria *Decastroporella inconstans* are present. Rarely *Rhapydionina dubia* and some orbitolins can be found. The above-mentioned microfuna association indicate an Albian/Cenomanian age of the Kotroman Formation.

Fig. 6. Thin bedded biomicrite of the Jatare Member (43°46'29.94'' N, 19°28'36.41'' E).

The Kotroman Formation at Jatare is, like at some other localities, overlain with thin bedded, marly, bituminous limestone of the Hemipelagic series with plain and well expressed bedding surfaces.

Depositional environment and stratigraphical problems

During the Early Cretaceous period, the area of the Inner Dinarides was a landmass composed of mafic and utramafic rocks with widespread weathering crust, due to intensive and deep weathering under humid climate conditions. Transgression, which started at the mid-Albian, initiated erosion and redeposition of sediments that include the basal series of the Cretaceous succession, i.e., the Kotroman Formation. This also includes the deposition of nickel/iron rich oolithic sandstones.

The sedimentation occurred in littoral and sublittoral environments. The water was shallow, warm, with limited circulation. Depending on the morphology of the sea-bottom, the water table was characterized by low

energy conditions in isolated and uneven depressions. The presence of charophytes and ostracodes in some layers strongly suggest irregular fresh water influx from the aforementioned land masses. There were periods of time when rapid input of clastic sediment ceased and calm environmental conditions allowed the fast growth of mollusk fauna. The origin of the nodular limestone texture is the product of later differential compaction, diagenesis and pressure dissolution of the sediment due to the clay content (JENKYNS 1974).

Detailed stratigraphic analyses in the area of Mokra Gora were not easy because of the somehow restricted character of the fossil assemblage. The collected lagoonal gastropod fauna, with *Pseudomesalia teniucostata*, *P. multicostata*, *Pirenella* cf. *levadhiae*, *Paraglauconia lujani*, *Bicarinella bicarinata* and *Cassiope kotromanensis*, indicates isolated sublittoral areas with limited aerial coverage, and with some features of endemism. This makes the comparison and correlation with other faunal assemblages from surrounding localities problematic and doubtful. This is supported by the fact that the gastropod family *Cassiopidae is* characterized by rapid ontogenical and phylogenical changes, e.g. MILOVANOVIĆ (1933), CLEEVELY & MORRIS (1988), MENNESSIER (1984), AKOPYAN (1976), KOLLMANN (1979).

The microfauna assemblage is represented by *Radoicicelapses sterni*, *Nezzazatinella* cf. *picardi*, *Hemicyclamina sigali*, *Salpingoporella urladanasi*, *Aeolisacus inconstans*, *Ovalveolina maccagnae*, *Rhapdionina laurinensis*, which indicate an Albian and possibly early Cenomanian age.

Conclusion

This preliminary research paper investigates a Cretaceous formation in western Serbia known as the Basal Series. A new lithostratigraphic term is proposed for this unit, the "Kotroman Formation" after the type locality and type section at the Kotroman village.

The stratigraphic columns from the described localities imply three members within the Kotroman Formation: (1) The Kamišna Member consist of clastites, up to 8 m thick, (2) The Uroševići Member consist of nodular limestone up to 27.5 m thick, and (3) the thin bedded marly limestone of Jatare Member up to 12.5 m in thickness. Nodular limestones are more or less present in all horizons of the Formation, although they predominate in the Uroševići Member. Paleontological analyses indicate an Albian–Cenomanian age. Deposition probably started during the mid-Albian, and continued up to Cenomanian.

Numerous beds of terrigenous clastics with gradual transitions to nodular limestones and fossiliferous strata point to frequent changes in the local environmental conditions during the mid Cretaceous time. We believe that, in some future work, the recognition and correlation of the depositional sequences of the investigated strata will lead to the assemble of a convenient model of the sequence stratigraphy for these deposits, which will be helpful in defining the stratigraphy of a wider area in western Serbia. The present study shows that in spite of the limited data, a definition of the formations and a detailed mapping of these lithostratigraphic units is possible.

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References

AKOPYAN, V.T. 1976. *Late Cretaceous Gastropods of the Armenian SSR*. 444 pp. Akademiâ Nauk Armânskoj SSR (in Russian).

BANJAC, N. 1994. *Geology of the Upper Cretaceous at Mokra Gora (western Serbia)*. 151 pp. Faculty of Mining and Geology, University of Belgrade (in Serbian).

BORTOLOTTI, V., FICCARELLI, G., MANETTI, P., PASSERINI, P., PIRINI-RADRIZZANI, C. & TORRE. D. 1971. Studies on mafic and ultramafic rocks. I – A Jurassic sequence on the top of Zlatibor ultramafic Massif (Jugoslavia). *Bolletino della Societa Geologica Italiana*, 90: 415–428.

CLEEVELY, R.J. & MORRIS, N.J. 1988. Taxonomy and ecology of Cretaceous Cassiopidae (Mesogastropoda). *Bulletin of the British Musseum (Natural History),* 44 (4): 233–291.

DULIĆ, I. 2003. *Palynomorphs from the Albian and Cenomanian in deposits of Yugoslavia*. 231 pp. Unpublished Ph.D. thesis, Faculty of Mining and Geology, University of Belgrade (in Serbian).

FOTIĆ, V. 1965. Geological composition and tectonic structures of the Mokra Gora basin with special attention on oolithic iron ores. *Vesnik Zavoda za geološka i geofizička istraživanja, A,* 22/23: 117–129 (in Serbian).

JANKOVIĆ, S. 1990. *The Ore depostis of Serbia – Regional metallogenic settings, environments of deposition, and types*. 760 pp. Republic fund for geological investigations & Faculty of Mining and Geology, University of Belgrade. (in Serbian).

JENKYNS, H.C. 1974. Origin of red nodular limestones (Ammonitico rosso, Knollen kalke) in the Mediterranean Jurassic: A diagenetic model. *In*: Hsü, K.J. & JENKYNS, H.C. (eds.), *Pelagic sediments: On Land and Under the Sea,* 1: 249–271. Special Publication of the International Association of Sedimentologists,

Jovanović, D., Ljubović-Obradović, D., Banjac, N., Radoičić, R. 2004. *Cretaceous formations of western Serbia (Sediments of Mokra Gora as a model of the Cretaceous formations of western Serbia)*. 20 pp. *Internal report*, "Geozavod-Gemini" (in Serbian).

Kollmann, H.A. 1979. Gastropoden aus den Losensteiner Schichten der Umgebung von Losenstein (Oberösterreich) 3. Teil – Cerithiacea (Mesogastropoda). *Annalen des Naturhistorischen Museums in Wien*, 82: 11–51.

Maksimović, Z. 1969. Alterations of Ultramafic rocks of Zlatibor. Geology of Zlatibor, *Radovi Geoinstituta, posebna izdanja*, 18, 39–40 (in Serbian).

Mennessier, G. 1984. Révision des Gastéropodes Appartenant á la Famille des Cassiopidae Kollmann (= Glauconiidae Ptchelintsev). *Travaux du Département de Géologie de l'Université de Picardie*, 1: 190 pp.

Milovanović, B. 1933. Contribution to the geology of western Serbia – Upper Cretaceous of the Mokra Gora basin. *Geološki Anali Balkanskoga Poluostrva*, 11 (2): 132–160 (in Serbian).

Mojsilović, S., Baklajić, D. & Đoković, I. 1978. *Basic geological map 1:100 000, K 34-4. Explanatory book for sheet Titovo Užice,* 50 pp. Savezni geološki zavod (in Serbian).

Olujić, J. & Karović, J. 1986. *Basic geological map 1:100000, K34-3, Explanatory book for sheet Višegrad,* 55 pp. Savezni geološki zavod (in Serbian).

Pejović, D. & Radoičić, R. 1971. Ueber die Stratigraphie der Kreideserie der Mokra Gora. *Bulletin Scientifique du Conseil des Academies des Sciences et des arts de la RSF de Yugoslavie (Section A),* 16 (7–8): p. 138.

Radoičić, R. 1995. Contribution to the Cretaceous Biostratigraphy of Zlatibor Mountain. *Radovi Geoinstituta*, 31: 17–30 (in Serbian).

Radoičić, R. & Schlagintweit, F. 2007. *Neomeris mokragorensis* sp. nov. (Calcareous alga, Dasycladales) from the Cretaceous of Serbia, Montenegro and the Northern Calcareous Alps (Gosau Group, Austria). *Geološki Anali Balkanskoga Poluostrva*, 68: 39–51.

Резиме

Албско-ценоманска Формација Котроман (Мокра Гора – западна Србија)

Кредне творевине су мало распрострањене у западној и северозападној Србији. Међутим, шира околина Мокре Горе је услед великог броја изданака проучавана од стране више аутора: Миловановић (1933, *cum. lit.*), Пејовић & Радоичић (1971), Радоичић (1995), Бањац (1994) и Дулић (2003). Тада су извршена и прва стратиграфска рашчлањавања. Детаљна истраживања изведена су током израде листова ОГК 1:100 000. Мојсиловић *и др*. (1978), Олујић и Каровић (1986). Јовановић *и др*. (2004) издвојили су више јединица нижег реда, које стратиграфски припадају албу, ценоману и турону. Најстарија тзв "Базална серија" лежи директно преко серпентинита или коре распадања. Асоцијација присутне микрофауне детаљно је описана од стране Radoičić & Schlagintweit (2007). Следи "Хемипелашка серија" Радоичић (1995), ценоманске старости, као и најмлађа серија плитководних спрудних творевина туронске старости.

"Базална серија" је откривена у непосредној околини Котромана, где је утврђена на неколико локалитета. За ову серију предложен је назив "Формација Котроман" према локалитету који је усвојен за типски профил ове формације (43°46'3.81" С, 19°28'22.05" И). Остали локалитети налазе се дуж долина Белог и Црног Рзава, око Кршања, Вардишта, Међедове љеске и на другим местима. У западном делу терена око Котромана и Урошевића, формација Котроман лежи директно преко серпентинита, док у источном делу лежи преко коре распадања дебеле неколико метара. Формација Котроман има дебљину од 50 m, а састоји се од кластита у нижем делу и лапоровитих кречњака у вишем делу стратиграфског стуба. Доња граница је оштра, трансгресивна, док је горња граница представљена постепеним прелазом према Хемипелашкој серији.

Издвојена су три члана нижег реда, названа према локалитетима где су развијени: Камишна, Урошевићи и Јатаре. Члан Камишне представљен је кластитима са гвожђевитим ооидима, фрагментима серпентинита, везаним карбонатним или глиновитим цементом. Поред конгломерата тамно сиви пешчари чине најважнији део овог члана. Остаци флоре и фауне су у овом члану ретки. Члан Урошевићи представљен је нодуларним биомикритима, који се смењују са жућкастим лапорцима. Најбоље је развијен код засеока Урошевићи (43°46'1.44" С, 19°28'7.11" И). Нодуле су уклопљене у мешавину глине и карбоната. Асоцијација микрофауне састоји се од примерака *Radoicicelapses sterni*, *Nezzazatinella* cf. *picardi*, *Salpingoporella urladanasi*, *Aeolisacus* sp., *Glomospira* sp. Макрофауна је представљена фрагментима *Cassiope* sp. Честа су инапертуратна зрна полена ксерофилних конифера (*Inaperturopollenites limbatus, Araucariacites australis, A. hungaricus, Cingulatipollenites aegyptica, Caliallasporites,* ретко *Cycadopites, Ephedripites, Steevesiapollenites, Eucommiidites* и др.). Међу зрнима полена ангиосперми чести су примерци *Retimonocolpites reticulates*. Ретко могу да се нађу и зрна Normapolles (*Complexiopollis* sp.). Члан Јатаре заузима највише делове формације и представљен је карбонатним лапорцима које местимично садрже богате асоцијације микрофауне у којима доминирају: *Aeolisacus inconstans*, *Ovalveolina maccagnae* и *Rhapidionina laurinensis*. Макрофауна је откривена на бројним локалитетима, местимично градећи праве лумакеле. Најчешће су то фрагменти мекушаца: *Amphidonte conicum*, *Ostrea callimorphe*, *O. cunabula*, *Pseudomesalia teniucostata*, *P. multicostata, Pirenella* cf. *levadhiae, Paraglauconia lujani*, *Bicarinella bicarinata* и *Cassiope kotromanensis*.

Бројни слојеви теригених кластита са постепеним прелазима ка нодуларним кречњацима указују на честе промене локалних услова седиментације током средње креде. Анализа присутне палеофлоре и палеофауне указала је на стратиграфску припадност формације Котроман алб-ценоману. Седиментација је највероватније почела током средњег алба и наставила се кроз ценоман.