JURASSIC RADIOLARIAN BIOSTRATIGRAPHY OF THE SEDIMENTARY COVER OF OPHIOLITES IN THE MIRDITA AREA, ALBANIA: NEW DATA

Mensi Prela*, **Marco Chiari**** and **Marta Marcucci****

***** *Institute of Geological Researches, Tirana, Albania.*
****** *Département Dipartimento di Scienze della Terra, Firenze, Italy (e-mail: mchiari@geo.unifi.it, marcucci@cesit1.unifi.it).*

Keywords: *ophiolitic succession, radiolarians, Jurassic, Mirdita Zone. Albania*

ABSTRACT

Radiolarian assemblages of Jurassic age were determined in six sections sampled of Kalur Cherts (siliceous sediments on the top of the Mirdita ophiolites) in the Mirdita area (Northern Albania). The studied sections are: Kalur, Lumthi, Bukemira, Stalosi, Simoni and Perlati i Eperm. The radiolarian assemblages indicate that the age of the bottom of the section ranges from late Bajocian-early Bathonian to late Bathonian-early Callovian. These ages are compared with those of other sections of the Kalur Cherts in Northern Albania.

INTRODUCTION

Radiolarian biostratigraphy, which in the last two decades has been carried out on the most part of the radiolarian cherts of the Mediterranean area, has been applied to the radiolarian cherts of Albania since 1992 (Marcucci et al., 1992; Kellici and De Wever, 1994; Marcucci et al., 1994; Chiari et al., 1994; Prela, 1994; Marcucci and Prela, 1996; Prela, 1996; Marcucci et al., 1998). Albanian cherts belong to both the ophiolite-bearing (oceanic) successions of the Mirdita Zone (Kalur Cherts) and to the carbonatic successions considered that have been interpreted as continental margin remains. The data available on the Kalur Cherts of Albania are summarized and updated in this paper. Six news sections are examined, and compared with eight sections described in earlier papers (Marcucci et al., 1992; Chiari et al., 1994; Marcucci et al., 1994; Prela, 1994, Marcucci and Prela, 1996). The newly examined sections have been partly described by M. Prela, in her unpublished PhD thesis (1995).

The dating of radiolarian chert deposition in Albania contributes to complete the picture of siliceous deposition in the Western Tethys. It also has bearings on the interpretation of the two belts of ophiolite complexes that have been defined on petrological and geochemical grounds (western MORB and eastern IAT type belt, Beccaluva et al., 1994).

GEOLOGIC FRAMEWORK

The ophiolite bearing units of Albania (Fig. 1, 2) constitute a nappe complex lying on epicontinental units: the Krasta-Cukali and Kruja Units at the western border of the ophiolite zone and the Korabi Unit at its eastern border.

Previous studies distinguished two ophiolites belts on the basis of their tectonic position and geochemical and petrological characteristics: ophiolites with Ti-rich basalts, which are interpreted as produced in a normal oceanic ridge (MORB-type), and ophiolites with Ti-poor basalts, which would have originated in suprasubduction condition (IAT-type, Bortolotti et al., 1996 and references therein). These two types of ophiolite would characterise, respectively, a western and an eastern ophiolite belt. However the petrological distinction between these belts, cannot be sharply drawn, since Bortolotti et al. (1996) reported from the western belt volcanic sequences which have, near their top, IAT-type flows intercalated to the MOR-basalts and low-Ti basaltic dikes. In both the western and the eastern belt, the ophiolites are covered by radiolarian cherts (Kalur Cherts; Bortolotti et al., 1996).

The radiolarian assemblages here described come from the Kalur Cherts in the Mirdita region of Northern Albania and,

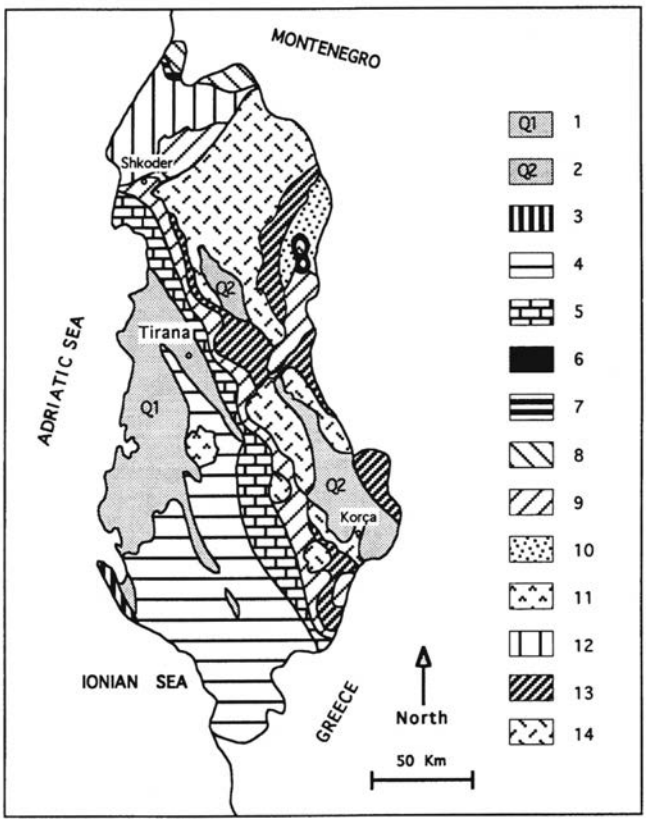

Fig. 1 - Geological sketch of Albania (after Bortolotti et al., 1996). 1- Neogene-Quaternary deposits of the PeriadriaticTrough (Q1); 2- Neogene-Quaternary deposits of the Albano-Thessalian trough (Q2); 3- Pre-Apulian Zone; 4- Ionian Zone; 5- Kruja Zone; 6- Tertiary Flysch of Peshkopi Window; 7- Vermoshi Zone; 8- Gashi Zone; 9- Krasta-Cukali zone; 10- Korabi zone; 11- Permo-Triassic Gypsum; 12- Albanian Alps; 13- Rubik complex; 14- Mirdita ophiolite nappe.

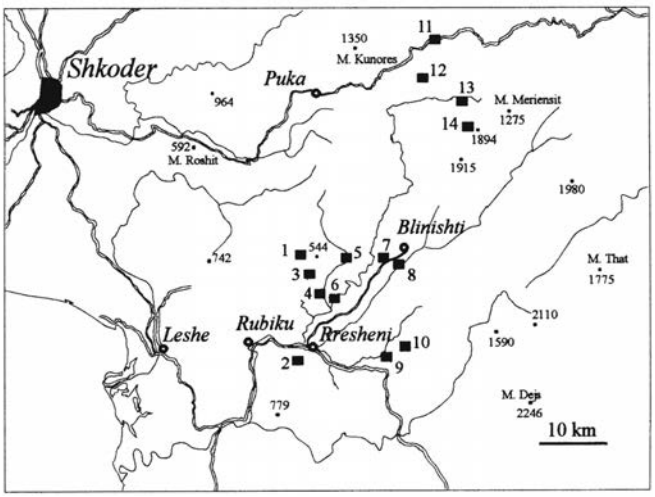

Fig. 2 - Location of the sections in the Kalur Cherts analysed up today: 1) Kalur, 2) Lumthi, 3) Bukemira, 4) Stalosi, 5) Simoni, 6) Gziqi, 7) Peshqesh Siperm, 8) Blinisht-Kullaxhi, 9) Perlati i Eperm 10) Shebaj, 11) Fushe Arrez, 12) Lumi i Zi, 13) Qafe Bari, 14) Munella. Sections 1 to 5 and 9 are examined in the present paper. Sections 6 to 8 and 10 to 14 have been described in earlier papers.

subordinately, from chert intercalations in the underlying basalts, and they belong to both the mentioned ophiolite belts.

The following sections are here described: Kalur, Lumthi, Bukemira, Stalosi, Simoni in the western belt and Perlati i Eperm in the eastern belt.

REMARKS CONCERNING RADIOLARIAN BIOCHRONOLOGY

The biochronology of radiolarian assemblages is based on the Unitary Association Zones (UAZ.) (Baumgartner et al., 1995b).

We observed in several samples the coexistence of forms that should not be associated, i.e. should have non-overlapping ranges according to Baumgartner et al. (1995a). More specifically we found the following associations:

In the sample AL 164 of the Bukemira section *Unuma* sp.A (UAZ. 4-6) coexists with *Syringocapsa* (?) sp. A (UAZ. 7-7), and *Theocapsomma cucurbiformis* (UAZ. 6-7).

In the sample AL 167 of the same section, *Syringocapsa* (?) sp. A (UAZ. 7-7) coexists with *Theocapsomma cucurbiformis* (UAZ. 6-7) and *Dicolocapsa* (?) *conoformis* (UAZ. 6-6).

In the sample AL 117 of the Kalur section, *Unuma latusicostatus* (UAZ. 2-5), *Tricolocapsa tetragona* (UAZ. 5-5) and *Tricolocapsa plicarum* ssp. A (UAZ. 4-5) coexist with *Theocapsomma cucurbiformis* (UAZ. 6-7), and in the sample AL 118 *Unuma* sp.A (UAZ. 4-6), *Paronaella mulleri* (UAZ. 6-10) and *Tricolocapsa plicarum* ssp.A (UAZ. 4-5) are present.

Discussion: Some of the forementioned species, such as *Syringocapsa* (?) sp. A, *Theocapsomma cucurbiformis* and *Tricolocapsa plicarum* ssp. A were described for the first time in Baumgartner et al. (1995a), and reported from a few sections only. It is obvious that the limited occurrences of these species reported by Baumgartner et al (1995a) resulted in incomplete ranges in their biochronological framework.

Our data suggest that the range of these species could be longer than previously supposed. The range of *Syringocapsa* (?) sp. A can be tentatively assigned as UAZ. 6?-7, that of *Theocapsomma cucurbiformis* as UAZ. 5?-7, and that of *Tricolocapsa plicarum* ssp. A as UAZ. 4-6?. Accordingly, the assemblage of sample AL 167 at Bukemira can be dated as UAZ. 6, and the assemblage of sample AL 164, stratigraphically below AL 167, as UAZ. 6?, the assemblage of sample AL 117 in the Kalur section can belong to UAZ. 5, and the age of the assemblage of sample AL 118 can be UAZ. 6.

These assignments are tentative. For a precise biochronologic assignment of these new co-occurrences we will re-run the new data together with the database of Baumgartner et al (1995b) to obtain a revised biochronology (work in progress).

SECTIONS DESCRIPTION

Bukemira Section

This section crops out on the left side of the road Bukemira-Simoni, just after the last houses of Bukemira. It includes, from bottom to top (Fig. 3): 1- basalt breccias; 2- red siliceous shales and red radiolarian cherts (about 3 m thick); 3- green recrystallized cherts and red shaly cherts (about 3 m).

The examined samples are five: AL 163, 164, 165, 166, and 167. These samples come, respectively, from 0.25, 0.45, 0.80, 1.30 and 1.70 m above the basalt breccias. The radiolarian assemblages are reported in Table 1.

The ages of the samples are:

AL 163 - latest Bajocian-early Bathonian to middle Bathonian (UAZ. 5?- 6) indicated by the occurrence of *Unuma* sp. A (UAZ. 4-6) and *Theocapsomma cucurbiformis* (UAZ. 5?-7).

AL 164 - middle Bathonian (UAZ. 6?) indicated by the presenceof *Unuma* sp. A (UAZ. 4-6) and *Theocapsomma cucurbiformis* (UAZ. 5?-7) with *Syringocapsa* (?) sp. A (UAZ. 6?-7).

AL 167 - middle Bathonian to late Bathonian-early Callovian (UAZ. 6), indicated by the occurrence of *Theocapsomma cucurbiformis* (UAZ. 5?-7), *Syringocapsa* (?) sp.A (UAZ. 6?-7) and *Dicolocapsa* (?) *conoformis* (UAZ. 6-6).

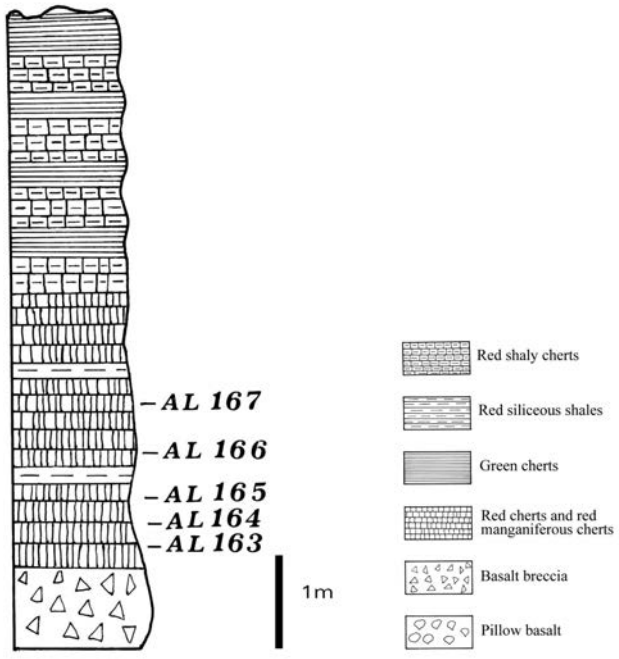

Fig. 3 - Lithological column of the Bukemira section.

Table 1 - Occurence chart of radiolarians in the Bukemira section.

Bukemira section			
	Samples		
Species	AL 163	AL 164	AL 167
Acanthocircus suboblongus suboblongus (Yao)		■	
Archaeodictyomitra sp.		■	
Archaeohagiastrum sp.			■
Bernoullius cristatus Baumgartner		■	■
Dicolocapsa (?) *conoformis* Matsuoka			■
Dictyomitrella (?) *kamoensis* Mizutani & Kido		■	
Eucyrtidiellum sp.		■	■
Guexella nudata (Kocher)		■	
Pantanellium sp.		■	
Paronaella sp. aff. *P. broennimanni* Pessagno		■	
Parvicingula (?) sp. cf. *P.* (?) sp. A Baumgartner et al.			■
Parvicingula dhimenaensis dhimenaensis Baumgartner		■	
Parvicingula dhimenaensis ssp. A Baumgartner et al.			■
Protunuma (?) *ochiensis* Matsuoka		■	
Protunuma sp. aff. *P. japonicus* Matsuoka & Yao		■	■
Protunuma sp. cf. *P. turbo* Matsuoka		■	
Quarticella (?) sp.		■	
Saitoum sp. cf . *S. trichylum* De Wever		■	
Sethocapsa funatoensis Aita		■	
Stichocapsa convexa Yao			■
Stylocapsa (?) sp.			■
Syringocapsa (?) sp. A Baumgartner et al.		■	■
Syringocapsa sp.	■		
Tetratrabs sp. aff. *T. izeensis* Yeh	■		
Theocapsomma cordis Kocher		■	■
Theocapsomma cucurbiformis Baumgartner	■	■	■
Theocapsomma sp.			■
Theocapsomma sp. cf. *T. cucurbiformis* Baumgartner		■	■
Tricolocapsa conexa Matsuoka		■	■
Tricolocapsa sp. aff. *T. plicarum* s.l. Yao			■
Unuma sp. aff. *U. latusicostatus* (Aita)	■		
Unuma sp. A Baumgartner et al.	■	■	
Williriedellum sp. A sensu Matsuoka			■
Xitus sp.			■

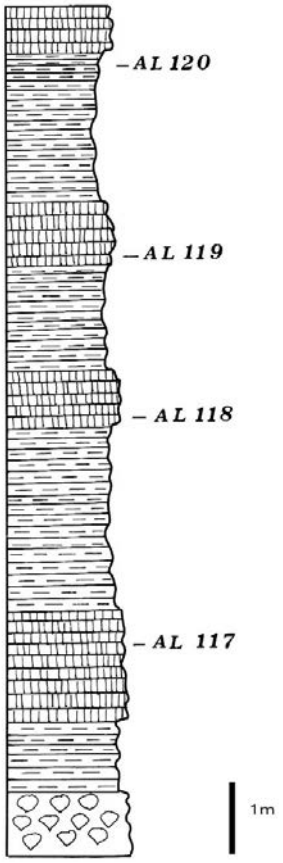

Fig. 4 - Lithological column of the Kalur sectio (legend see Fig 3).

Kalur Section

This section crops out on the road Kalur-Bukemira, just 50 m after the village of Kalur.

From bottom to top, it consists of (Fig. 4): 1- pillow basalts; 2- red siliceous shales (1 m); 3- red manganiferous radiolarian cherts (1.5 m); 4- red siliceous shales (2.5 m); 5- red radiolarian cherts (0.80 m); 6- red siliceous shales (1.5 m); 7- red radiolarian cherts (0.80 m); 8- red siliceous shales (2 m); 9- red manganiferous radiolarian cherts (0.60 m).

We examined four samples: AL 117, 118, 119, and 120. The samples come, respectively, from 2.30, 5.10, 7.50 and 9.80 m above the pillow basalts. The radiolarian assemblages are reported in Table 2.

The ages of the samples are:

AL 117 - latest Bajocian-early Bathonian (UAZ. 5) for the coexistence of *Unuma latusicostatus* (UAZ. 2-5), *Tricolocapsa tetragona* (UAZ. 5-5) and *Theocapsomma cucurbiformis* (UAZ. 5?-7) .

AL 118 - middle Bathonian (UAZ. 6) for the coexistence of *Tricolocapsa plicarum* ssp. A (UAZ. 4-6?) and *Unuma* sp. A (UAZ. 4-6) with *Paronaella mulleri* (UAZ. 6-10).

Table 2 - Occurence chart of radiolarians in the Kalur section.

Kalur section				
	Samples			
Species	AL 117	AL118	AL119	AL120
Acanthocircus suboblongus suboblongus (Yao)		■	■	
Amphipyndax sp. aff. *A. tsunoensis* Aita			■	
Archaeodictyomitra (?) *amabilis* Aita		■		
Archaeodictyomitra (?) sp. A Baumgartner et al.			■	
Archaeospongoprunum sp. aff. *A. macrostylum* (Rüst)		■	■	
Dictyomitrella (?) *kamoensis* Mizutani & Kido	■	■	■	■
Eucyrtidiellum unumaense s.l. (Yao)		■	■	■
Eucyrtidielum unumaense pustulatum Baumgartner	■			
Guexella nudata (Kocher)		■		■
Hsuum sp. cf. *H . robustum* (Pessagno & Whalen)				■
Hsuum sp. C Yamamoto et al.		■		
Obesacapsula magniglobosa Aita		■		
Pantanellium sp.	■			
Pantanellium sp. cf. *P. riedeli* Pessagno		■		
Paronaella mulleri Pessagno		■		
Parvicingula (?) sp. cf. *P* . (?) sp. A Baumgartner et al.			■	
Parvicingula (?) sp. aff. *P.* (?) sp. A Baumgartner et al.		■		
Parvicingula (?) *spinata* (Vinassa)				■
Parvicingula dhimenaensis s.l. Baumgartner			■	
Parvicingula dhimenaensis ssp. A Baumgartner et al.	■			
Parvicingula sp. cf. *P. gigantocornis* Kishida & Hisada	■			
Protunuma (?) *ochiensis* Matsuoka		■		■
Protunuma sp. cf. *P. japonicus* Matsuoka & Yao	■			
Protunuma turbo Matsuoka		■		
Saitoum levium De Wever	■	■		■
Sethocapsa funatoensis Aita		■		
Sethocapsa sp.	■			■
Stichocapsa convexa Yao		■		■
Stichocapsa japonica Yao	■	■		
Stichocapsa naradaniensis Matsuoka			■	
Stichocapsa sp. cf. *S. naradaniensis* Matsuoka	■			
Stichocapsa robusta Matsuoka		■		■
Stichocapsa sp. cf. *S. robusta* Matsuoka	■			
Stylocapsa (?) sp.	■			
Theocapsomma bicornis Baumgartner			■	
Theocapsomma cordis Kocher		■	■	■
Theocapsomma cucurbiformis Baumgartner	■			
Theocapsomma sp. cf. *T. bicornis* Baumgartner			■	
Theocapsomma sp. cf. *T. cordis* Kocher				■
Theocapsomma sp. cf. *T. cucurbiformis* Baumgartner	■	■		■
Transhsuum sp.	■			
Transhsuum brevicostatum gr. (Ozvoldova)	■	■	■	■
Transhsuum maxwelli gr. (Pessagno)	■			
Transhsuum sp. cf. *T. maxwelli* gr. (Pessagno)				■
Tricolocapsa conexa Matsuoka	■			■
Tricolocapsa plicarum ssp. A Baumgartner et al.	■	■		
Tricolocapsa tetragona Matsuoka	■			
Tricolocapsa sp. cf. *T. rüsti* Tan	■			
Tricolocapsa sp.	■	■	■	
Unuma latusicostatus (Aita)	■			
Unuma sp. A Baumgartner et al.	■	■		
Unuma sp. cf. *U* . sp. A Baumgartner et al.			■	
Xitus sp.		■		

AL 119 - middle Bathonian to late Bathonian-early Callovian (UAZ. 6-7) for the presence of *Archaeodictyomitra* sp. A (UAZ.6-7), *Theocapsomma bicornis* (UAZ. 6-7) and *Stichomitra naradaniensis* (UAZ. 6-7).

AL 120 - latest Bajocian-early Bathonian to late Bathonian-early Callovian (UAZ. 5-7) for the occurence of *Tricolocapsa conexa* (UAZ. 4-7) and *Stichocapsa robusta* (UAZ. 5-7).

Lumthi Section

This section is located along the road Rresheni-Derveni mine, about 2.5 kilometres west of Rresheni. The section, from bottom to top, includes: 1- pillow basalts, 2- red radiolarian cherts (4 m thick). The section crops out discontinuously, and the contact between cherts and basalts is not exposed (Fig. 5).

Two samples (LUM 1, LUM 4) were studied from this section. They come, respectively, from the base of the chert section and from it top. The radiolarian assemblages present in these samples are reported in Table 3.

The ages of the samples are:

LUM 1 - middle Bathonian to late Bathonian-early Callovian (UAZ. 6-7) for the occurence of *Stylocapsa oblongula* (UAZ. 6-8), *Stichocapsa robusta* (UAZ. 5-7) and *Archaeodictyomitra* (?) *amabilis* (UAZ. 4-7).

LUM 4 - middle Bathonian to late Bathonian-early Callovian (UAZ. 6-7) for the occurence of *Archaeodictyomitra* (?) *amabilis* (UAZ. 4-7), *Stylocapsa oblongula* (UAZ. 6-8) and *Theocapsomma cucurbiformis* (UAZ. 5?-7).

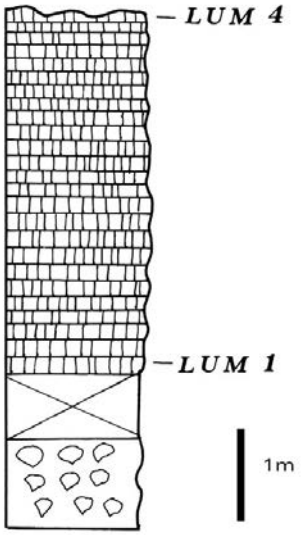

Fig. 5 - Lithological column of the Lumthi section (legend see Fig 3).

Table 3 - Occurence chart of radiolarians in the Lumthi section.

Lumthi section		
	Samples	
Species	LUM 1	LUM 4
Archaeodictyomitra (?) *amabilis* Aita	■	■
Dictyomitrella (?) *kamoensis* Mizutani & Kido	■	
Guexella nudata (Kocher)		■
Parvicingula cappa Cortese	■	■
Protunuma sp.	■	■
Protunuma sp. cf. *P. turbo* Matsuoka	■	■
Saitoum sp.	■	
Sethocapsa sp. cf. *S. funatoensis* Aita	■	
Sethocapsa sp.	■	
Stichocapsa robusta Matsuoka	■	
Stylocapsa oblongula Kocher	■	■
Theocapsomma cordis Kocher	■	■
Theocapsomma cucurbiformis Baumgartner	■	■
Tricolocapsa conexa Matsuoka		■
Tricolocapsa sp. cf. *T. conexa* Matsuoka	■	
Williriedellum sp. cf. *W. carpathicum* Dumitrica		■
Xitus (?) sp.	■	■

Perlati i Eperm Section

The section is on the left side of the road Perlati-Troja, a few metres after Perlati and before an irrigation channel.

From bottom to top it consists of: 1- basalts; 2- siliceous foliated shales (0.05 m in thickness); 3- red manganiferous radiolarian cherts (1.90 m).

The three studied samples AL 157, AL160, AL 162 come, respectively, from 0.05, 1, and 1.90 m above the basalts (Fig. 6). The radiolarian assemblages present in these samples are reported in Table 4.

The ages of the samples are:

AL 157 - late Bathonian-early Callovian (UAZ. 7) for the occurence of *Theocapsomma* sp. A (UAZ. 7-7), *Stichocapsa robusta* (UAZ. 5-7) and *Eucyrtidiellum unumaense dentatum* (UAZ. 6-7).

AL 160 - late Bathonian-early Callovian (UAZ. 7) for the occurence of *Archaeodictyomitra* sp. A (UAZ. 6-7), *Archaeodictyomitra* (?) *amabilis* (UAZ. 4-7) and *Theocapsomma* sp. A (UAZ.7-7).

AL 162 - late Bathonian-early Callovian (UAZ. 7) for the coexistence of *Dictyomitrella* (?) *kamoensis* (UAZ. 3-7) and *Stichocapsa robusta* (UAZ. 5-7) with *Zhamoidellium ventricosum* (UAZ. 7-11).

Simoni Section

The section crops out on the left side of the road Simoni-Kaçinari, few metres after Simoni.

From bottom to top it consists of: 1- pillow basalts; 2- red siliceous shales and red radiolarian cherts (0.35 metres in thickness); 3- red siliceous shales which include small pillow basalts (0.30 m); 4- red shaly radiolarian cherts (1.10 m); 5- covered for 1.50 m; 6- red radiolarian cherts (about 3 m).

Only one sample (AL 171) has been examined in this section. This sample comes from the level 2, 0.35 m above the pillow basalts (Fig. 7). The radiolarian assemblage is reported in Table 5.

The age of the sample is:

AL 171 - latest Bajocian-early Bathonian (UAZ. 5) for the occurence of *Tricolocapsa plicarum* s.l. (UAZ.4-5) and *Tricolocapsa tetragona* (UAZ.5-5).

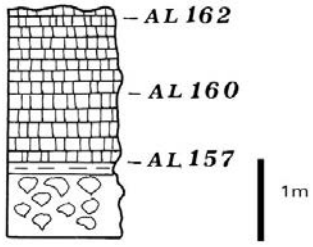

Fig. 6 - Lithological column of the Perlati i Eperm section (legend see Fig 3).

Table 4 - Occurence chart of radiolarians in the Perlati i Eperm section.

Perlati i Eperm section			
	Samples		
Species	AL 157	AL 160	AL 162
Amphipyndax sp. aff. *A. tsunoensis* Aita		■	
Archaeodictyomitra (?) *amabilis* Aita		■	
Archaeodictyomitra (?) sp. A Baumgartner et al.		■	
Archaeodictyomitra sp.			■
Archaeodictyomitra sp. cf. *A. patricki* Jud	■		
Dictyomitrella (?) *kamoensis* Mizutani & Kido	■		■
Eucyrtidiellum sp.	■		■
Eucyrtidiellum sp. cf. *E. unumaense dentatum* Baumgartner	■		
Eucyrtidiellum unumaense dentatum Baumgartner	■		
Eucyrtidiellum unumaense s.l. (Yao)			■
Obesacapsula magniglobosa Aita			■
Obesacapsula sp.			■
Parvicingula (?) *spinata* (Vinassa)		■	
Parvicingula cappa Cortese			■
Parvicingula dhimenaensis s.l. Baumgartner	■		
Parvicingula sp.	■		
Protunuma (?) *ochiensis* Matsuoka	■		
Protunuma (?) sp. cf. *P. ochiensis* Matsuoka	■	■	
Protunuma sp. cf. *P. turbo* Matsuoka	■		■
Pseudocrucella sp.			■
Saitoum levium De Wever	■	■	
Sethocapsa sp.	■		
Sethocapsa sp. aff. *S. funatoensis* Aita		■	
Stichocapsa convexa Yao		■	
Stichocapsa robusta Matsuoka	■		■
Stichocapsa sp.	■		
Stichomitra (?) *takanoensis* gr. Aita			■
Stylocapsa oblongula Kocher	■		■
Podobursa sp.		■	
Theocapsomma cordis Kocher	■		
Theocapsomma sp. A Baumgartner et al.	■	■	
Transhsuum brevicostatum gr. (Ozvoldova)	■	■	
Transhsuum maxwelli gr. (Pessagno)		■	
Transhsuum sp. cf. *T. maxwelli* gr. (Pessagno)	■	■	
Tricolocapsa conexa Matsuoka	■		
Tricolocapsa sp. cf. *T. conexa* Matsuoka		■	■
Unuma sp. cf. *U.* sp. A Baumgartner et al.	■	■	
Williriedellum sp. A sensu Matsuoka	■		
Williriedellum sp. cf. *W.* sp. A sensu Matsuoka		■	
Zhamoidellum ventricosum Dumitrica			■
Zhamoidellum sp. cf. *Z. ventricosum* Dumitrica	■		■

Table 5 - Occurence chart of radiolarian in the Simoni section.

Simoni section	
	Sample
Species	AL 171
Archaeodictyomitra sp.	■
Archaeodictyomitra sp. A Pessagno & Whalen	■
Hemicryptocapsa sp.	■
Protunuma sp.	■
Protunuma turbo Matsuoka	■
Stichocapsa japonica Yao	■
Stichocapsa sp.	■
Tricolocapsa tetragona Matsuoka	■
Tricolocapsa plicarum sl. Yao	■
Tricolocapsa sp.	■
Unuma sp.	■

Stalosi Section

The site of this section is 1 kilometre north- northwest of the village of Gziqi.

From bottom to top the section consists of: 1- pillow basalt breccias; 2- red and green radiolarian cherts with interbedded red siliceous shales (3 metres in thickness); 3- red and green recrystallized cherts with siliceous shales (5 m).

The fossiliferous samples in this section are: MU 1, MU 3, MU 5 and come respectively from 0.20, 0.80 and 1.45 m above the pillow basalt breccias (Fig. 8). The radiolarian assemblages are reported in Table 6.

The ages of the samples are:

MU 1 - late Bathonian-early Callovian (UAZ. 7) for the coexistence of *Theocapsomma* sp. A (UAZ. 7-7) and *Stylocapsa catenarum* (UAZ. 6-7) with *Williriedellium carpathicum* (UAZ. 7-11).

MU 3 - late Bathonian-early Callovian (UAZ. 7) for the occurence of *Theocapsomma* sp. A (UAZ. 7-7), *Stichocapsa naradaniensis* (UAZ. 6-7) and *Tricolocapsa conexa* (UAZ. 4-7) .

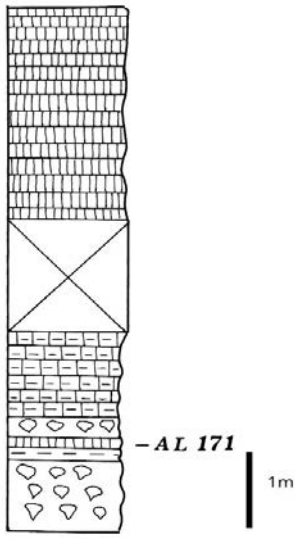

Fig. 7 - Lithological column of the Simoni section (legend see Fig 3).

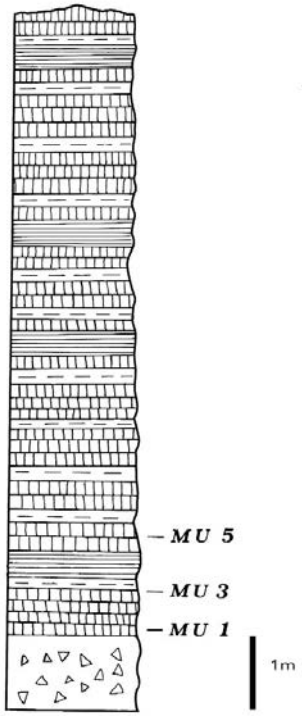

Fig. 8 - Lithological column of the Stalosi section (legend see Fig 3).

Table 6 - Occurence chart of radiolarians in the Stalosi section.

Stalosi section			
	Samples		
Species	MU 1	MU 3	MU 5
Archaeodictyomitra (?) *amabilis* Aita			■
Archaeodictyomitra sp.	■		■
Archaeodictyomitra sp. aff. *A. minoensis* (Mizutani)		■	
Archaeodictyomitra sp. cf. *A. patricki* Jud			■
Archaeospongoprunum sp.		■	
Bernoullius cristatus Baumgartner		■	■
Cyrtocapsa (?) sp. aff. *C.* (?) *kisoensis* Yao			■
Dictyomitrella (?) *kamoensis* Mizutani & Kido	■	■	
Eucyrtidiellum sp.			■
Eucyrtidiellum sp. cf. *E* . sp. F Nagai & Mizutani		■	
Hsuum (?) sp.	■		
Obesacapsula magniglobosa Aita		■	
Parahsuum sp.			■
Paronaella sp.		■	
Poulpus sp. aff. *P. oculatus* De Wever in Baumgartner et al.			■
Protunuma japonicus Matsuoka & Yao			■
Protunuma (?) *ochiensis* Matsuoka	■	■	■
Protunuma turbo Matsuoka		■	
Protunuma sp. cf. *P. japonicus* Matsuoka & Yao	■		
Protunuma sp. cf. *P. turbo* Matsuoka	■		
Protunuma sp.	■		
Saitoum trichylum De Wever			■
Sethocapsa funatoensis Aita	■		■
Stichocapsa japonica Yao		■	
Stichocapsa naradaniensis Matsuoka		■	
Stichocapsa sp. aff. *S. robusta* Matsuoka	■		
Stichocapsa sp. cf. *S. naradaniensis* Matsuoka	■		
Stichocapsa sp.	■		
Stylocapsa catenarum Matsuoka	■		
Stylocapsa oblongula Kocher	■	■	■
Stylocapsa sp. cf. *S. catenarum* Matsuoka		■	
Theocapsomma bicornis Baumgartner			■
Theocapsomma cucurbiformis Baumgartner	■		
Theocapsomma sp. A Baumgartner et al.	■	■	■
Transhsuum medium Takemura		■	
Tricolocapsa conexa Matsuoka	■	■	■
Tricolocapsa sp. cf. *T. plicarum* ssp. A Baumgartner et al.	■		
Tricolocapsa sp.	■		
Unuma (?) sp.	■		
Unuma sp. aff. *U.* sp. A Baumgartner et al.		■	
Williriedellum carpathicum Dumitrica	■		
Williriedellum sp.	■	■	■
Xitus (?) sp.	■		
Zhamoidellum ventricosum Dumitrica	■		■

MU 5 - late Bathonian-early Callovian (UAZ. 7) for the presence of *Theocapsomma* sp. A (UAZ. 7-7), *Protunuma japonicus* (UAZ. 7-12), *Zhamoidellium ventricosum* (UAZ. 7-11) and *Theocapsomma bicornis* (UAZ. 6-7).

FINAL REMARKS

The basal age of the Kalur Cherts in these sections (Fig. 9) ranges from late Bajocian-early Bathonian (UAZ. 5, according to the zonation of Baumgartner et al., 1995b) to late Bathonian-early Callovian (UAZ. 7).

Previous studies of the Kalur Cherts in the Northern Albania indicated that the ages of the bottom of the sections range from late Bajocian-early Bathonian (UAZ. 4-5) to middle Callovian-early Oxfordian (UAZ. 8) (Marcucci et al., 1992; Chiari et al., 1994; Marcucci et al., 1994; Prela, 1994, Marcucci and Prela, 1996).

The ages of the basal Kalur Cherts (Blinisht-Kullaxhi, UAZ. 4/5; Simoni, UAZ. 5; Kalur, UAZ. 5; Peshqesh i Siperm, UAZ. 5; Lumi i Zi, UAZ. 7; Qafe Bari, UAZ. 8) suggest that the end of basalt effusions and of the sea-floor spreading in the "ophiolite basin" (Mirdita Zone) of Albania occurred at different times. The youngest age (middle Callovian-early Oxfordian, UAZ. 8) is limited to the northern part of the "eastern belt" (Qafe Bari and, probably Lumi i Zi, Fig. 9). This may give a clue to the interpretation of the relationships between the two ophiolite belts. However, up to now a general distinction between the sedimentary cover of the ophiolites in the western and eastern belts cannot be drawn on a chronological basis (Fig. 9).

As a last point it is worthwhile nothing that several radiolarian forms of the examined assemblages are widespread in the Jurassic radiolarian cherts of Japan and their presence in Albania, together with forms of radiolarians which are typical of the Tethyan successions of the Perimediterranean area, suggests that a connection existed between the "Mediterranean" section of the Tethys and the Jurassic basins of Japan.

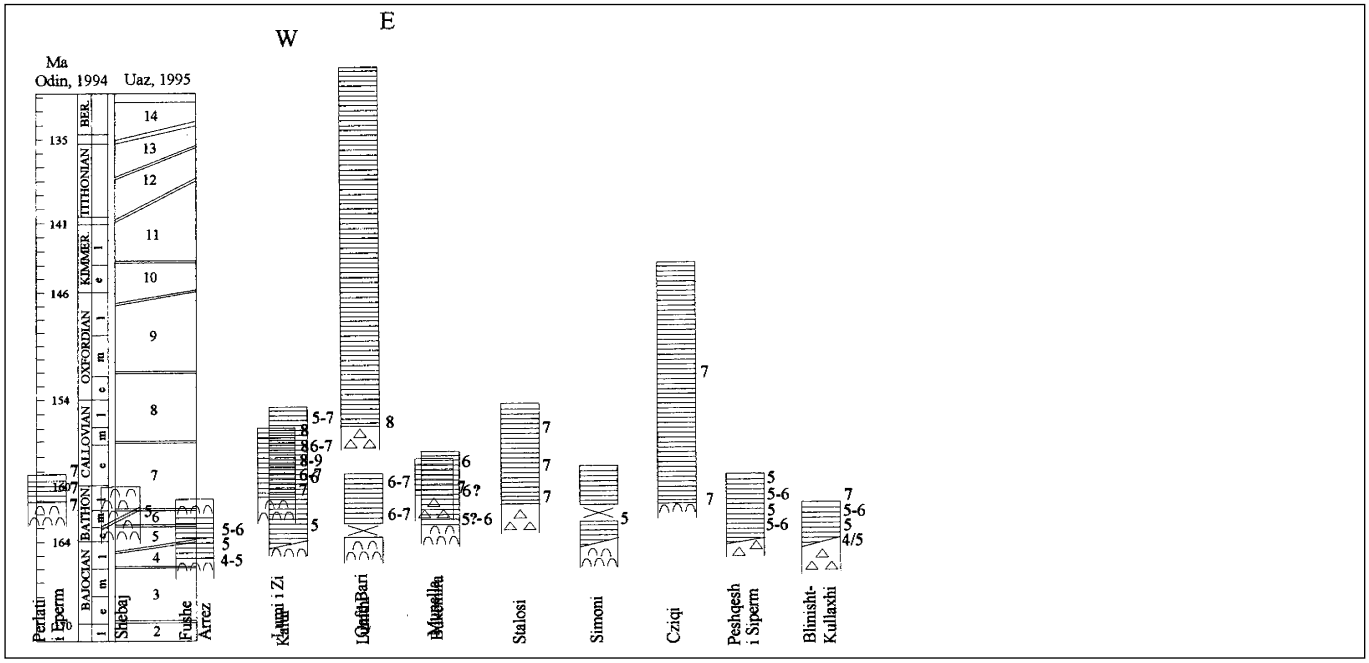

Fig. 9 - Age determinations in the Kalur Cherts, UA Zones from Baumgartner et al., 1995.

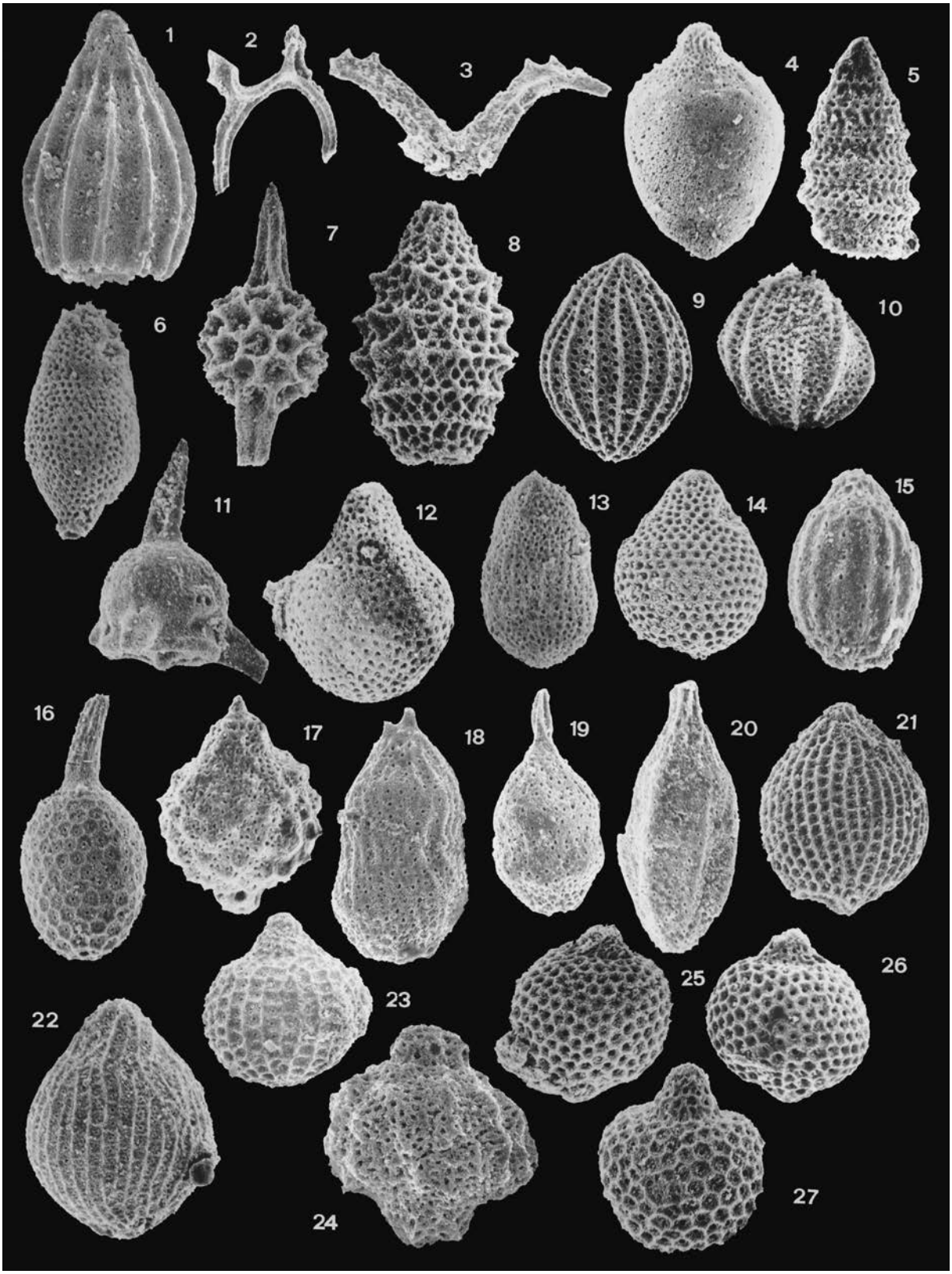

Plate 1 - 1) *Archaeodictyomitra* (?) *amabilis* Aita, MU 5, x460; 2) *Acanthocircus suboblongus suboblongus* Baumgartner, AL 164, x110; 3) *Bernoullius cristatus* Baumgartner, AL 164, x220; 4) *Dicolocapsa* (?) *conoformis* Matsuoka, AL 167, x330; 5) *Dictyomitrella* (?) *kamoensis* Mizutani & Kido, Al 120, x280; 6) *Guexella nudata* (Kocher), LUM 4, x280; 7) *Pantanellium* sp. cf. *P. riedeli* Pessagno, AL 118, x330; 8) *Parvicingula dhimenaensis* ssp. A Baumgartner et al., AL 117, x330; 9) *Protunuma* (?) *ochiensis* Matsuoka, MU 1, x280; 10) *Protunuma turbo* Matsuoka, AL 171,x280; 11) *Saitoum levium* De Wever, AL 118, x330; 12) *Stichocapsa convexa* Yao, AL 167, x220; 13) *Stichocapsa naradaniensis* Matsuoka, MU 3, x330; 14) *Stichocapsa robusta* Matsuoka, AL 118, x220; 15) *Stylocapsa catenarum* Matsuoka, MU1, x440; 16) *Stylocapsa oblongula* Kocher, MU 1, x330; 17) *Syringocapsa* (?) sp. A Baumgartner et al., AL 164, x280; 18) *Theocapsomma bicornis* Baumgartner, MU 5, x390; 19) *Theocapsomma cucurbiformis* Baumgartner, AL 163, x330; 20) *Theocapsomma* sp. A Baumgartner et al., MU 5, x330; 21) *Tricolocapsa conexa* Matsuoka, MU 3, x280; 22) *Tricolocapsa plicarum* ssp. A Baumgartner et al., AL 118, x330; 23) *Tricolocapsa tetragona* Matsuoka, Al 171, x280; 24) *Unuma latusicostatus* (Aita), AL 117, x390; 25) *Williriedellum carpathicum* Dumitrica, MU 1, x280; 26) *Williriedellum* sp. A sensu Matsuoka, AL 167, x280; 27) *Zhamoidellum ventricosum* Dumitrica, MU 5, x330.

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Received, April 6, 2000
Accepted, June 7, 2000