

PROPOSALS FOR SCIENTIFIC RESERVES IN THE CHEILE BICAZULUI – HĂȘMAȘ NATIONAL PARK AREA (THE EASTERN CARPATHIANS – ROMANIA)

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Abstract. We are here proposing as scientific reserve four palaeontological sites in the area of the Cheile Bicazului – Hășmaș National Park. Three of them are located on the northern and western sides of Ghilcoș Mountain and the fourth in the northwest of Hășmașul Mare Mountain. Two sites are important for Kimmeridgian biostratigraphy, bearing a rich fauna of ammonites. Another site is a lumachelle with brachiopods and is unique in the country due to the *Lacunosella* species contained. The fourth is an Early Cretaceous reef „in situ”, peculiar through its exceptional preservation of fossils. There are discussed the reasons for protection, based on scientific evaluation of each site.

Keywords: scientific reserve, Hășmaș, National Park.

Rezumat. Propuneri de rezervații științifice în aria Parcului Național Cheile Bicazului – Hășmaș (Carpații Orientali – România). În lucrare sunt propuse patru situri paleontologice ca rezervații științifice ale Parcului Național Cheile Bicazului – Hășmaș. Trei dintre ele sunt localizate în nordul și vestul muntelui Ghilcoș, iar cea de-a patra, în nord-vestul muntelui Hășmașul Mare. Două situri sunt importante pentru biostratigrafia Kimmeridgianului, conținând o bogată faună de amoniți. Un alt sit reprezintă un lumachel cu brahiopode, unic în țară prin speciile de *Lacunosella* conținute, iar cel de-al patrulea reprezintă un recif „in situ” din Cretacul inferior, deosebit prin modul excepțional de conservare a fosilelor. Sunt discutate argumentele în favoarea protecției bazate pe evaluarea științifică a fiecărui sit.

Cuvinte cheie: rezervații științifice, Hășmaș, Parc Național.

INTRODUCTION

In the framework of 'GEOBIOHAS' Project there were analyzed many palaeontological sites from the Cheile Bicazului – Hășmaș National Park (CBHNP) (GRIGORE et al., 2009). Based on palaeontological, biostratigraphical, and paleogeographic studies and evaluation of the scientific heritage, we selected these sites for this proposal. As we observed before, we remind here this necessity of special protection for some of these sites, not only for their scientific importance but also to prevent any possible damage (physical ones). Here we put in discussion all the aspects regarding scientific value and protection arguments.

The kimmeridgian with ammonites from Ghilcoș

F1 – named in the Catalogue of palaeontological sites from CBHNP (GRIGORE et al., 2009).

This site was discovered by Herbich F. in 1866.

The site is located on the base of the western walls of Ghilcoș Mountain in the middle zone (Fig. 9, 11, 12). That portion of the wall is not vertical, dipping with 40-70 degrees. The Kimmeridgian–Early Tithonian deposits are well exposed here (see Figs. 1, 2, 4). The area is about 200 m large and has a medium height of 35 m (maximum heights 60 and minimum of 15), reduced to 2.5 hectares. The protected area must include the slope debris, with few big blocks which are full of fossils.

The fossils assemblage is dominated by ammonites (175 species) documenting the Kimmeridgian–Early Tithonian age of these deposits, where the Kimmeridgian is well developed. There were described species (by Neumayr, Herbich, Preda and Grigore) from many genera like: *Phylloceras*, *Sowerbyceras*, *Lytoceras*, *Taramelliceras*, *Glochiceras*, *Streblites*, *Hemihaploceras*, *Idoceras*, *Nebroditites* (Fig. B), *Presimoceras*, *Lessinicerias*, *Trenerites*, *Progeronia*, *Schneidia*, *Lithacoceras*, *Torquatisphinctes*, *Crussoliceras*, *Virgalithacoceras* (Fig. C), *Subplanites*, *Orthosphinctes*, *Parataxioceras*, *Aspidoceras*, *Physodoceras*, *Epaspidoceras*, *Pseudowagenia*, *Schaireria*, *Orthaspidoceras*, *Hybonoticerias*, *Sutneria*, *Aulacostephanus*, *Gravesia* and others (the complete list and detailed palaeontology in GRIGORE, 2002). Special mention are: the largest representation of *Sutneria* in the world, many important holotypes for Kimmeridgian had been found here, the mixture of Mediterranean and Submediterranean faunas offering the possibility of correlations, presence of plants besides ammonites as special



Figure A. *Pygope janitor* (PICTET 1867) (x 1) (Photo: Lazăr Iuliana).



Figure B. *Nebroditites doublieri* (D'ORBIGNY 1850). (x 0.75) (Photo: Grigore Vlad).

assemblage.

Less frequent in this assemblage are: aptychus (*Laevaptychus*, *Lamellaptychus* species), brachiopods (*Pygope*, *Nucleata* species) (Fig. A), bivalves (*Cuspidaria*, *Astarte*, species), gastropods (*Natica*, *Neritopsis*, *Acteonina*, *Pleurotomaria* species), belemnites (*Conobelus*, *Hibolites* species), echinoids (*Cidaris*, *Colyrites* species), sponges (*Metaporphinus* species), corals, fishes (*Sphaerodus*), and plants (some *Zamitidae*). The micropalaeontological studies (DRAGASTAN, 1975; NEAGU & NEAGU, 1995) revealed the presence of various algae and protozoan.

This Kimmeridgian is the most representative of Romania and possibly has international importance for its assemblage of ammonites and as Type Locality for many species.

Special references: HERBICH (1866, 1878), NEUMAYR (1873), JEKELIUS (1921), PATRULIUS (1960), PEDA & PELIN (1965), GRASU (1969), SĂNDULESCU (1975), PEDA (1973), DRAGASTAN (1975), PEDA et al. (1976), GRASU & TURCULEȚ (1980), TURCULEȚ (1980), NEAGU & NEAGU (1995), GRIGORE (1996, 2000a, 2000b, 2002, 2009, in press), GRIGORE & MARCU (2009), GRIGORE et al. (2009), TURCULEȚ & GRIGORE (2006).

The kimmeridgian with ammonites from Lacu Roșu

F2 – in the Catalogue of palaeontological sites from CBHNP (GRIGORE et al, 2009).

This site was discovered by Herbich F. in 1866.

The site is located on the northwestern slope of Ghilcoș Mountain and in the vicinity of Lacu Roșu locality (Figs. 3, 9, 11, 12). The area includes blocks and some Kimmeridgian – Early Tithonian exposures full of ammonites. The squared area is located on the ancient land slide and is about 200x180 m large (about 3.5 hectares).

The fossils content is similar to the first site, afore described.

The reasons for this proposal are: possible to be a relict Kimmeridgian with a different facies from the walls (GRIGORE, 2002, in press) and, the great accumulation of fossils, more accessible.

Special references: HERBICH (1866, 1878), NEUMAYR (1873), JEKELIUS (1921), PATRULIUS (1960), PATRULIUS et al. (1969), PEDA (1973), GRIGORE (1996, 2000a, 2000b, 2002, 2009, in press), GRIGORE & MARCU IULIANA (2009), GRIGORE et al. (2009), TURCULEȚ & GRIGORE (2006).



Figure C. *Virgalithacoceras tantalus* (HERBICH 1878) (x 0.40). (Photo: Grigore Dan).

The kimmeridgian with *lacunosella* from Fagu Oltului

F13 – named in the Catalogue of palaeontological sites from CBHNP (GRIGORE et al, 2009).

This site was discovered by Herbich F. in 1878.

The site is located in the 'Fagu Oltului' Valley, in the springs area. In this portion, the valley is narrow, forming gorges excavated in Jurassic limestone. The gorges are opened gradually to the west of Hășmaș Massif and descend in few steps of relief. From the upper step to the second, there are outcrops with fossils. In upper step, there are opened Late Tithonian deposits bearing *Nerinea lumachelle* and in the next step, there are Kimmeridgian deposits with brachiopods (Fig. 5). This area, with more vertical surfaces of interest is about 1.0 hectares in map projection (Fig. 10).

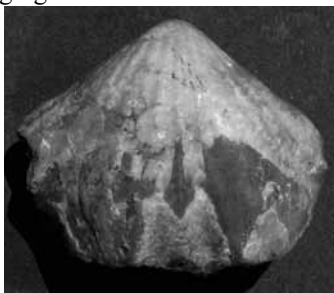


Figure D. *Lacunosella* sp. (x 1). (Photo: Lazăr Iuliana).

The assemblage is represented by a very abundant oligospecific association (Fig. 7), strongly dominated by *Lacunosella* species (70%) (Fig. D), *Septaliphoria* and *Rhynchonella* species (20%), and related to quite distal red crinoidal limestone (*Saccocoma* facies). The presence of some brachiopod species was mentioned by HERBICH (1878). LAZĂR et al. (2009) mentioned some interesting aspects of the preservation of brachiopods which argues this proposal: "The degree of preservation is remarkable, the attachment surface of the diductor muscles and the mantle canal patterns are very well preserved in almost all individuals".

This outcrop was studied in the Geobiohas Project and the final work papers are now in preparation. Special references: GRASU (1964, 1971), PELIN (1965), PEDA (1973), LAZĂR et al. (2009), LAZĂR et al. (in preparation).

The Early cretaceous reef from Ghilcoș

F28 – in the Catalogue of palaeontological sites from CBHNP (GRIGORE et al., 2009, Geobiohas Report).

Here first mention.

The site is located on the northern slope of Ghilcoș Mountain, near to the local monastery and the road to the Bicăjel Valley (Fig. 6). The site was discovered by the team of GEOBIOHAS Project in the summer of 2009.

It is a gentle ridge interposed between Ghilcoș and Surduc, as a foot extended from Ghilcoș, to the northeast side. The first analyses reveal a massive accumulation of corals, sponges, and algae with intercalary greenish marls.



Figure 1. Western wall of Ghilcos Mountain; upper part with sandstones, marls and nodular lime, predominately grey greenish colored. Figure 2. Western wall of Ghilcos Mountain; detail of the red nodular limestone and ammonites, naturally prominent. Figure 3. One block ("D") from F2 site with well preserved stratification. Figure 4. Western wall of Ghilcos Mountain of the red nodular limestone and ammonites. (Photos 1-3: Lazăr Iuliana; 4 - Constantinescu Adriana).

Figura 1. Peretele de vest al muntelui Ghilcos; partea superioară cu gresii, marne și calcar nodular, predominant de culoare gri cenușiu. Figura 2. Peretele vestic al muntelui Ghilcos; detaliu de calcar nodular roșu și amoniti, reliefate natural. Figura 3. Un bloc ("D") din situl F2 cu stratificare bine conservată. Figura 4. Peretele vestic al muntelui Ghilcos de calcar nodular roșu și amoniti.

It's a Lower Cretaceous bioherme with a very rich content of fossils. The preservation status of fossils is exceptional (Fig. 8).

The assemblage is dominated by various species of corals (from the *Thecosmilia*, *Latusastrea*, *Axosmilia*, *Epismilia*, *Cyathophora*, *Holocystis*, *Stylina*, *Eugyra*, *Montlivaltia*, *Flexigyra*, *Trochocyathus* (Fig. E), *Clausastrea*, *Dimorphastrea*, *Acrosmilia*, *Meandraea*, and *Microphyllia* genera). Brachiopods (*Cyclothyris* and *Cyrtothyris* species) are frequent too and less frequent, there are the bivalves (*Neithea*, *Requenia*, *Ostrea*, *Pecten* species), gastropods (*Tylostoma*, *Gynodes*, *Sculpturaea*, *Leptomaria* species), echinoids (*Cidaris*, *Discoidea* species), worms (*Serpula*, *Rotularia* species), and sponges (*Peronidella*, *Phalaginum* species). A similar association was described from 'Izvorul Alb', a more northern area (near the Rarău Mts.) by previous authors (MORYCOWA E, 1971 and TURCULEȚ I, 2004).



Figure 5. Site with Kimmeridgian brachiopods (*Lacunosella*) in the „Fagu Oltului” Valley. Figure 6. Site from northern Ghilcoș with Cretaceous reef. Figure 7. Limestones with *Lacunosella*. Figure 8. Cretaceous coral from site F28. (Photos 5, 7 – Lazăr Iuliana; 6 – Paraschiv Valentin; 8 – Cioacă Vladimir).

Figura 5. Situl cu brachiopode Kimmeridgian (*Lacunosella*) din Valea Fagu Oltului. Figura 6. Situl de la nord Ghilcoș cu recif cretacic. Figura 7. Calcare cu *Lacunosella*. Figura 8. Coral cretacic din situl F28.



Motifs for special preservation are: density of fossils, exceptional conservation of fossils, a very rich fossil assemblage and the Cretaceous reef is possible to be preserved “*in situ*” with regional geologic importance (unique in the Hășmaș Nappe).

The position of the outcrop creates some problems for a real preservation. The area of special preservation must include the limestones with the bioherme and the Quaternary deposits around them, which are full of well preserved fossils (naturally already extracted). The problem of restrictions in this place mainly refers to the nearby populated area and the roads (Figs. 9, 12). No special references.

Figure E. *Trochocyathus* sp. (x 1) Foto: Cioacă V.

Technical documentation

Maps: topographic and administrative: 1:25,000 (Figs. 9, 10); 1:5,000 (Fig. 11)

Geologic: 1:50,000 (SĂNDULESCU et al., 1975);

Topographic plans (in work):

Litho- and biostratigraphical columns:

Reserve 1 (F1) – 1:1,000 and 1:200

Reserve 1 (F1) – 1:100

Reserve 2 (F2) – 1:1,000 and 1:200
 Reserve 3 (F13) – 1:1,000
 Reserve 4 (F28) – 1:1,000

Reserve 2 (F2) – 1:100
 Reserve 3 (F13) – 1:100
 Reserve 4 (F28) – 1:100

Tables:

Fossils content - species, specimens, inv., collection, site/section/bed, age/stage/zone/subzone (F1, F2, F13 and F28 in work) (GRIGORE, 2002; LAZĂR et al., in preparation);

Fossils content – authors/review/Types specimens (F1, F2) (GRIGORE, 2002);

Compared content: Ammonites genera in Europe from Kimmeridgian and Early Tithonian (GRIGORE, 2002)

Technical references:

Reserve 1 (F1)

Category: proposal for IUCN I (at list III)

Area: about 2.5 hectares

Altitude: about 1,080 m

Coordinates: no public for the moment

Owner: CBHNP (Cheile Bicazului – Hășmaș National Park)

Reserve 2 (F2)

Category: proposal for IUCN I (at list III)

Area: about 3.5 hectares

Altitude: about 1,150 m

Coordinates: no public for the moment

Owner: CBHNP

Reserve 3 (F13)

Category: proposal for IUCN I (at list III)

Area: about 1.0 hectares

Altitude: 1,250 m

Coordinates: no public for the moment

Owner: CBHNP

Reserve 4 (F28)

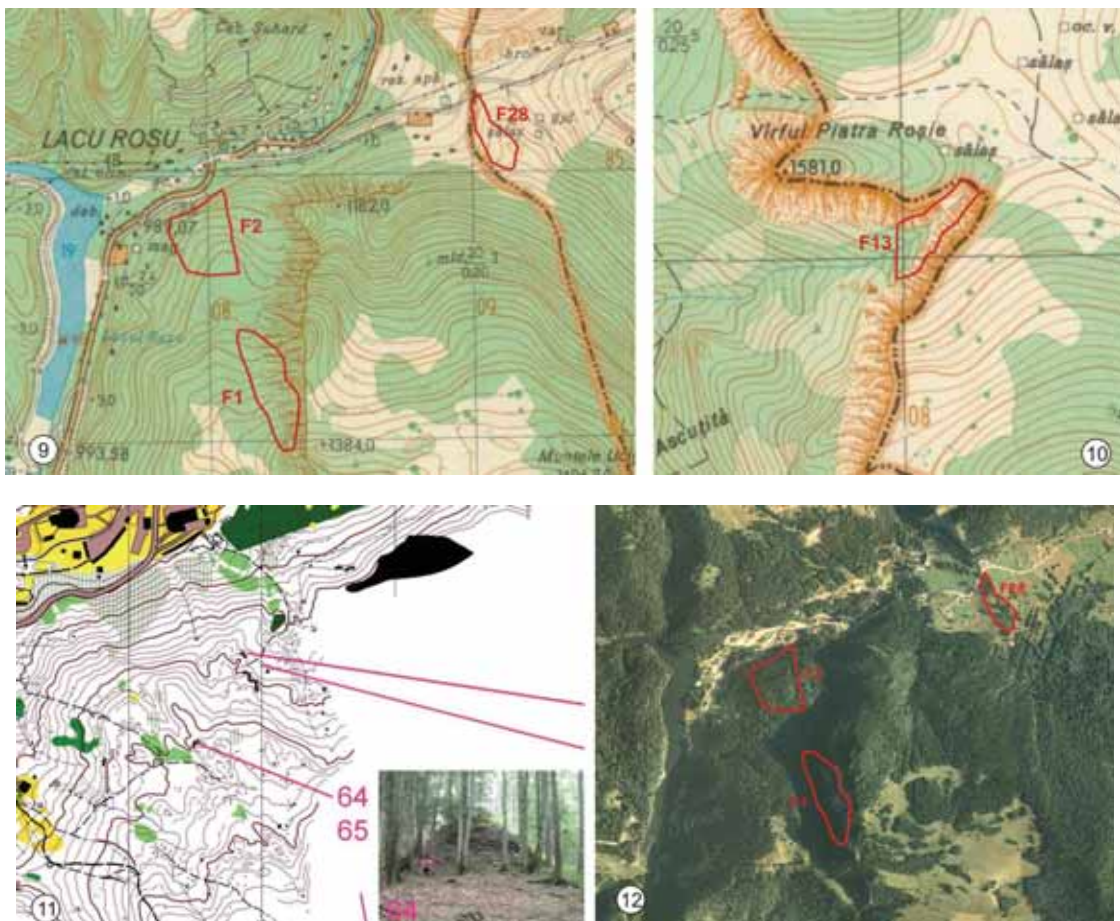
Category: proposal for IUCN I (at list III)

Area: about 1.5 hectares

Altitude: about 1,060 m

Coordinates: no public for the moment

Owner: CBHNP(?)



Figures 9, 10. Proposed reserves location on the topographic map 1:25,000 scale. Figure 11. Details on the topographic map 1:5,000 for F2 reserve. Figure 12. Reserves location on the aerophotoplan.

Figurile 9, 10. Localizarea rezervațiilor propuse pe harta topografică scara 1:25.000. Figura 11. Detalii pe harta topografică 1:5.000 pentru rezervația F2. Figura. 12. Localizare rezervații pe ortofotoplan (ANCPI 2003-2005).

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