RESEARCH FOR THE DEVELOPMENT KNOWLEDGE ON BUILA-VANTURARITA NATIONAL PARK GEODIVERSITY

Florin Stoican[1]

[1] Department of Mineralogy, University of Bucharest, 1 Nicolae Balcescu Avenue, Bucharest, Romania

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Abstract

The Buila-Vanturarita National Park, the 12th national park in Romania and the 2nd in the Valcea district, was created by the Government Decision 2151/2004, as a result of a Kogayon Association project. The protected area was assigned by the Romanian Academy – The Comission for Protection of the Natural Monuments - and by the Ministry of Environment and Water Management – the Direction for Biodiversity and Biosecurity – in the 2nd category of IUCN, whish states for "national park"; this assignment came as a conclusion after analyzing the "Scientific Basis Study of the Buila-Vanturarita National Park" provided by the Kogayon Association. Although it is the smallest national park in Romania on 4186 ha, Buila-Vanturarita, gathers very valuable elements that lead to its status of national park: lineary ridges of Jurassic calcareous stones with karst relief (exokarst and endokarst), valuable components of the flora and fauna, that are all part of the geodiversity notion. The pluridisciplinary research studies realized by the Kogayon Association during the development of the project for the creation of the national park and afterwards, have contributed to the deep knowledge of the geodiversity in thi area.

General characters

Buila-Vanturarita massif lyes in the central- northern part of the Valcea district and it is part of the Capatanii Mountains. The main peak of the Capatanii Mountains, consisting mainly of crystalline schists (the Sebes-Lotru series) has an east-to-west laydown, with secondary peaks towards north and south. There are two exceptions, two calcareous ridges that are disposed from south-west to north-east: Tarnovu Massif in north-west and Buila-Vanturarita in south east.

Buila-Vanturarita Massif lays from the west of the Bistrita Gorges to the east of Olanesti Gorges (Folea). The connection to Capatanii Mountains is made by Plaiul Netedu (the interfluviu between the Bistrita and Costesti rivers), Plaiul Lespezi (interfluviu between the Costesti and Cheia rivers) and Plaiul Hadarau (interfluviu betweeen the rivers Cheia and Olanesti).

Buila-Vanturarita Ridge has a linear type of space extension, with the length of 14 km and the width of 0.5 km and 2.5 km (extension of the Jurassic calcareous stones). The absolute altitude is in the Vanturarita Peak (1885 m) and the minimum is at the exit of Bistrita from its straits (500 m). The areas with altitudes over 1800 m can be found in two small parts of the center, around the Buila and Vanturarita I Peaks, representing only 1.4% of the total area. Between 1400 m and 1800 m are 14% of the total surface (the central part and Mount Stogu). The largest extend is occupied by the areas with altitudes between 1000 m and 1400 m (56.8%), and the areas under 1000 m represent 27.3%.

The tectonic setting

As tectonic structure, the studied area is part of the Carpathean orogeny. The Buila-Vanturarita Massif is part of the Getic Layer, unit of the Mediane Dacides of the Meridional Carpathians (Sandulescu, 1984). The Mediane Dacides of the Meridional Carpathians have been set to place during the Senonian, inside the Laramide tectogenesis. Out of all the drifting units of the Mediane Dacides, the largest area goes to the Getic Layer, made of prealpine cristallofilian structures and of a sedimental cover inside which the oldest deposits are the ones aged in the Superior Carbon. The Getic Layer occure in the Leaota Mountains, the Sebes-Lotru Mountains, Capatanii Mountains, Godeanu Mountains, southern Poiana Rusca Mountains, Semenic Mountains and in the cover spots Bahna, Portile de Fier and Valari. Becouse of the

erosion, sedimental deposits of the Getic Stratification can be found only in a few areas, most important being Brasov-Dambovicioara, Buila-Vanturarita, Hateg and Resita-Moldova Noua. This sediment deposits have been through the tectogenetic processes in two phases. The first mentioned unconformability is pre-Albian, when the getic drifting begun and it corresponds to the first getic stage (Codarcea, 1940), the age of the first mounting being identified after the Inferior Aptian and before the end of the Superior Aptian. The second getic phase, representing the main laramide drifting, took place in the Senonian, when the Getic Layer, having as a basis the Severin Layer, covered the Danube Domain.

Stratigraphy

In the Buila-Vanturarita Massif there are a succession of metamorphical and sedimental deposits, that can be traced entirely on the openings offered by the valleys of the four rivers that cross the calcareous ridge, each one digging a sector of narrow straits.

Crystalline formations

In the Buila-Vanturarita Massif the metamorphical rocks occure on the north-west slopes, on the valleys of the rivers Bistrita, Costesti, Cheia and Olanesti, as well as in the top area, where they come out from under the sedimental deposits eroded (Curmatura Builei). The metamorphic evolution of the gnaisic units from the Getic Stratification is included in the time period of the Varisc Cycle (300-350 M.a.) (dates Ar/Ar, Pb/Pb and Sm/Nd) (Iancu et al., 2003). The succession is composed by the metamorphical rocks of the Capatana lythogroup, belonging to the Sebes-Lotru lythogroup. Consequently, inside this lythogroup have been outlined two structures with lythological differences and with singular evolutions in their mostpart: Ursu Formation and Vaideeni Formation separated by a mounting plan older than the one of the Getic Stratification.

Sedimental Formations

After the completion of the Baikalian cycle, that generated epimetamorphic crystalline schysts, the Getic Domain evolued as an emerged area submitted to denudation. It became an area of sedimenting in the neo-Carbonifer, when there were mainly continental deposits accumulated. In the Alpin Cycle, the sedimentation process begins after the emergency stage that continued during the Triassic. During the Jurassic, several hollows are drawn, and among those there also is Buila-Vanturarita. The Getic Domain emerged again after the tectogenesis from the meso-Cretaceous. After that moment, there came a transgression during the Cenomanian, but the sedimentary formations are, mostly, removed by through erosion. In the Buila-Vanturarita area, the successive sedimentation processes took place during the Superior Jurassic and the Inferior Cretaceous.

Based on the sedimentology studies carried out on the samples from the calcareous stones taken from the Massif, the following conclusions were reached:

- Petrotypes: pelsparite, boundstone, bindstone, biopelsparite, mudstone, rudstone and wakestone, all characterized by a certain point of fragmentation, probably of tectonic nature (calcareous sedimentary breccias and/or tectonic or calcirudite ones, with different elements gathered in a micrite matrix). There were also found samples where on a small area one could identify several petrotypes, especially starting from a petrotype easy to define by textural characteristics, to another petrotype formed by pieces that got detached from the first one.

- The biofacies are varied and the associations of organisms are dominated by the algae and choralgae bio-buildings, having as associates other organism groups like the bivalves, gasteropods, bryozoan, calpionelle, foraminifers, etc.

- The diagenesis processes identified here: cement: composites of calcite and ferrous calcite and mosaic morphological, drusical and poikilitical; 4 generations of fractures, each one corresponding to a type of cement; stylolites, resulted from the processes of dissolving under pressure; the metasomatism of the dolomite. The dolomite processes are not accompanied by anything except secondary fracrures filled with a dark-coloured matrix, probably of organic-argilous type, which shows that these processes occured late, in the telogenesis stage.

As a conclusion after this analysis, we can say that these limestones were submitted to diagenesis processes in different stages, during their burial. The diagenesis processes occured in a first burial phase,

that probably took place during the Cretacic, untill the Palaeogene-Miocen period, after which came an up-lift phasis that lead to a karsting stage, with dissolving (vadose silt). It is possible that there have been several karsting stages that preceeded a stage of burial in an unoxigenated environment.

Characterization of the relief

The individuality of the Buila Vanturarita Massif in the Capatanii Mountains aspect is undeniable and impressive. This is due, on one hand, to the detachment by construction and general evolution from the mountain chains that surround it, and, on the other hand, to the morphografic characters and the morfometrical particularities totally different from what the Capatanii Mountains can offer elsewhere (S. Roata, 1998). As opposed to the Capatanii Mountains, Buila-Vanturarita has special characters, specific for the linear and insular limestone ridges.

The main ridge has a 14 km length, with homogenous features only between the Costesti Gorges and the Cheia Gorges, with a small interruption in the Curmatura Builei area (where the sedimentaty stratum was eroded down to the metamorphic deposits), otherwise being fragmented by the rivers that dug narrow straits (from west to east: Bistrita, Costesti, Cheia and Olanesti), that separate two massifs: Arnota (in the south-west, between the Bistrita and the Costesti rivers) and Stogu (north-east, between the Cheia and Olanesti rivers), that look different compared to the main ridge. The ridge has a bumpy aspect, only on small areas it has smooth platforms (Mount Cacova and Mount Albu), the predominant feature being that of stair ridge, dominated by rounded peaks (Piatra Buila) or sharp ones (Vanturarita). The northern sector of the main ridge has got the aspect of a sharp and crenellated ridge, even though the height lowers gradually. The erosion and disintegration released residual witnesses of the jagged erosion, shaped as crenels or needles, some of big dimensions (35 m), especially on the western side of the massif. The secondary ridges are generally short (under 1 Km) and fall in steps to east. Only in Mount Cacova there are smooth ridges and there are round top sectors in Mount Cacova and Mount Piatra. As a result of this analysis, several geomorphological maps have been drawn up: hypsometric maps, the relief declivity map, the map of the density and of the depth of the relief fragmentation, the map of the configuration of the slopes and the general geomorphological map.

Hydrological features

The entire hydrographical network of the Buila-Vanturarita Massif is tributary to the Olt River, through its direct or indirect affluents on the right, with a north-to-south direction of course: Bistrita, Costesti, Otasau, Cheia, and Olanesti. The underground waters have been very active, generating numerous endokarstic phenomena, represented by cca 120 caves, and many other exokarstic phenomena smaller as amplitude: steepness, springs, dry valleys, and narrow straits. There are also numerous exokartic phenomena: steepness, swallets, dry valleys, narrow straits.

Flora and fauna – protected species

Up to now, on the Buila-Vanturarita National Park territory have been identified over 80 protected species of the flora (28 Orchidaceae species) and over 30 protected species of the fauna, research being in course, and the park will be included in the European Ecological Network NATURE 2000.

The floristic and faunistic diversity of the ecosystems inside the Buila-Vanturarita National Park is really large, due to a complex of factors: mountain relief, the great frequency of limestone at daylight, marked into the relief through straits sectors and small isolated massifs with abrupt slopes, horns, cracks, dry valleys, detritus, that support a very interesting flora, the relatively mild climate, with submediterranean influences, favorable to the expansion of some relatively thermophilic species. Inside the mountain relief there is a great diversity of the habitat types (ecological entity indicating the life environment of each species, biotic and abiotic at the same time):

1. Habitats on stone and in caves: rocky detritus of the mountain level, calcareous detritus and calcareous crystalline schists of the mountain level up to the alpine level, rocky calcareous slopes, calcareous detritus and plates;

2. Forestry habitats: afforested fields, Luzulo-Fagetum forests, Asperulo-Fagetum forests, acidophilus forests with Picea from the sub alpine level.

3. Habitats in the fields and shrubs: different subtypes of alpine and boreal fields, dry fields with several subcategories, alpine calcareous fields, associations of skirt with high hygrophytic herbs, alluvial north-boreal fields, mountain hayfields, afforested hayfields.

4. Habitats in peat bogs and swamps, on small surfaces.

This complex of factors, in connection with the position related to the other genetic centers and migration ways of the flora and fauna, determined the occurrence of several very dissimilar elements: Eurasian, European and central-European, Alpine-Carpathian, sub-Mediterranean, Carpathian-Balcanic, and a series of endemic and sub-endemic species.

The dominating elements on the Buila limestones are, generally, the Eurasian ones (22.6%), that together with the European (13.2%) and central-European ones (11.2%) embrace more than half of the total of species.

They are followed by the circumpolar area (9.6%), balkan-dacic (8.3%), alpine (8.1%), central-alpine (6.8%), endemic (6.8%), continental (4.9%), mediterranean (4.9%), ubicvestre (3.6%).

Pedology

Generally, among the Buila-Vanturarita NP soils, the dominant are rendzine, due to the calcareous configuration of the massif. In the fagus level there are podzolic humic-aluvional soils, brown acid and alpine and forestry fields, with an acid reaction and different degrees of podzolization. In the coniferae level there are podzolic soils, brown acid and podzolic humic-aluvional. In the stone cracks there is turbidite soil, on which there are special adaptations species – hasmofit. Along the Bistrita valley, there are alluvial soils.

Tourism

The Buila-Vanturarita Massif, with his special potential, meets all the optimum conditions for the development and practicing the tourism under different shapes: mountain tourism, agro-tourism, cultural tourism, monastic tourism, sports tourism, recreational tourism etc. The area disposes of: a well developed road access network - including the National Road 67 Ramnicul Valcea – Targu Jiu, that passes by the south-west part of the massif, very close to it -, county roads, communal asphalted streets, a net of forestry roads on the valleys of Bistrita, Costesti, Otasau, Cheia and Olanesti and a well organized and marked net of traveler's mountain itineraries, a net of accommodation units in Ramnicul Valcea, Baile Olanesti and Horezu, a few pensions and boarding houses for tourists in Horezu, Costesti, Barbatesti, Cheia and Olanesti, and high standards accommodation units inside the Bistrita and Horezu Monasteries.

There are many tourist's attractions, natural as well as cultural-historical:

- Natural: Bistrita, Costesti, Cheia and Olanesti Straits, around 120 caves, the massif's ridge with special and attractive landscapes, the Trovanti Museum etc.

- Anthropic: the monasteries Horezu, Bistrita, Arnota, Patrunsa, Pahomie, Iezer, Jgheaburi, Bradul, Frasinei, many churches dating from the XV-XX centuries, museums, old houses, traditions and customs still preserved, itineraries for climbing properly arranged.

Conclusions

All these elements found in the Buila-Vanturarita National Park, can be grouped under the biodiversity notion, contributing to the achievement of national park status for this area, a second category for a protected area in the IUCN classification. The notion of National Park must be considered under several aspects, the role of this category of protected area being conservative, scientific and touristic. The combination of all these elements means a solid development of the area, because the park could become a development center for the entire region. The knowledge of the geodiversity and its contribution to the foundation and management of the national network of the protected areas can only be achieved by a through a pluridisciplinary approach, that covers all the aspects related to that area. By this type of approach in conducting the researches in the Buila-Vanturarita National Park, the Kogayon Association is trying to provide a complete knowledge of the area that will support a good management of the park on both short as well as long term.

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