A PROPOSAL FOR THE ESTABLISMENT OF THE “PERŞANI” GEOPARK. A REASON FOR PROMOTION OF EDUCATIONAL TOURISM

Key words: Perşani Mountains geopark, geotourism, education tourism.

Abstract. The Perşani Mountains, as part of the Curvature Carpathians, are a “bridge” between the Eastern and the Southern Carpathians, a “threshold” between the Brașov Depression and the Transylvania Plateau. While low in altitudes (Mâgura Codleii, 1 292 m) they impose themselves by a large variety of geomorphological landscapes. The responsibly for this are the real geological “mosaic” and a dense network of tectonic lines in a rectangular arrangement. Out of the 16 nature reserves, which occupy 14% of the Perşani Mountains, nine are exclusively geological and geomorphological and the other three support forms of special landscapes. The study of this diverse patrimony concentrated in the Perşani Mountains, is a thorough motivation to institutionalize a geopark here. As arguments supporting the establishment of the Perşani Mountains Geopark we should also underline the fact that, apart geological, botanic, wildlife, hydrologic or mixed natural areas, the complementary character is justified by the existence of several archaeological sites or buildings with architectural value. Another argument in support of our proposal is the fact that natural reservations have a fully scientific character. The sites become a target for the tours organized by teachers for students at different levels, a “school” in nature we can consider today as the basis for educational geotourism.

1. The Romanian Carpathians Bend, an original mountain environment*

The Romanian Carpathian space, positioned between the Ukrainian border and the River Danube, covers most of the South-Eastern part of the Carpathians,

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more exactly 4/5 of its surface. They cover, on a length of 910 km, an area of 66,303 km$^2$, which is the equivalent of 27, 91% of the country’s territory (238 391 km$^2$). Within the country’s territory, the Carpathian Mountains meet the most diverse range of landscapes: sharp ridges, rocky peaks dominating rounded ridges or forested and leveled ridges, which get connected to the levels of erosion, then valley corridors or lanes, keys and gorges, as well as more or less flat basins. This aspect represents the most important feature of Romania, that of a Carpathian country, besides the other two: Danubian and Pontic. For Romania, as a country and nation, the axiom: “Carpathian, Danubian and Pontic country” clearly expresses the fundamental geographical features of the country, as well as the tight connection between the environment and the entire geohistorical evolution of the country. The valleys, as well as the numerous gorges and passes have meant as many possibilities of trans-Carpathian circulation, while the depressions at the side of the mountains, or those concatenating on the longitudinal valleys have meant the possibility for an intra-Carpathian circulation. They have facilitated the access to the low, peripheral regions, a solid geographical argument for the process of humanization (in the sense of “inhabiting”) the mountain area [1].

Since antiquity, there have been numerous theories regarding the role of the Romanian Carpathians in the architecture of the present day Romania. Thus, on the Romanian territory, the Carpathians create towards the east and south the tightest arch, in all its European unfolding. Together with the Apuseni and Banat Mountains, which enclose the arch to the west, there has been created a real circular fortress, whose peri-Carpathian “buttresses” are supported by the outer hills and plains. This “orographic fortress”, with the shape of a “crown” (in Latin, the old documents call it corona montium, Iordanes, 4th century, cited by Conea, (1944), lodges in fact, inside the Transylvania plateau, a large intra-Carpathian basin, with the landscape consisting mainly of hills. Corona Montium which the Dacians considered part of their culture [21], represented the core of their territory, and that is why specialists in geography and history attribute this space with the role of ethnogenesis for the Romanian people. The basins inside this area, where the population has settled, represented not only the “hearth” but also the resources of longitudinal Carpathian transhumance. This is the argument given by the members of the Romanian community whom I met in 1992, on the northern ridge of the Wooded Carpathians, in Poland (very close to the geographical research station of Szymbark of the Polish Academy of Sciences), which had its origins in Rud village, Marginimea Sibiului region. By imitating, on a smaller scale, this pattern, the Romanian Carpathians Bend, placed between the southern ends of the Eastern Carpathians and the eastern ends of the Southern Carpathians, create a smaller “crown”, around the Braşov Basin. The Bend’s ridges, which surround this basin, are those of Baraolt and Bodoc to the north, Perhani Mountains to the west, Bucegi and Piatra Craiului towards the south, but also those in the Bend area: Postăvarul and Piatra Mare. Due to its position, the basin appears as a discontinuity area between these mountains emphasized morphometrically [1].

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2. Some Geological consideration

- The discordant disposition of major orographic linea against structural lines—from a morphogenetic viewpoint, the most intricate part of all flysch-underlain mountains;

- The flysch sheets is the reflection of tectonic events: slow-going sinking on the inner flank, or reduced positive crustal movements and marked uplifting on the outer flank [18];

- The drainage network crossing the Paleogene flysch along one and the same valley, meets all such geomorphological processes; they are triggered by the different sandstone facies alternating with clay and marly schists;

- The folded formations of the Paleogene Flysch generate a particular morphology which shows up in the wide diversity of primary or secondary landforms;

- Long subaerial evolution and of present day neotectonic movements which accelerate erosion, depend on the varied resistance of sandstone rock to climate rather than on the narrow-folded structure;

- The relief being young, cement and granulometry are best revealed by landsliding which permanently maintains instability on slopes;

- The longest mountain volcanic area in the Europe there is in the Carpathians Mountains (800 km): Slovakya, Hungary, Ukrayna and Romania: Persani Mountains is the Southernmost and the most recent volcanic area (0.35 millions years) (Table 1).

Table 1 The age of the basalts in the Perșani Mountains [16]
The longest European volcanic chain. The forms of relief created by the recent volcanic eruptions, through their accessibility, allow the free access of tourists to the volcanic units, as well as to basaltic lava flows, in the Perşani Mountains. They are part of the southernmost point of the chain of volcanic mountains, which have recently finished their activity. Overall, the volcanic mountains chain, over 800 km long, begins in the Western Carpathians in Slovakia, Hungary and Ukraine, and up to the Romanian territory, on the western part of the Eastern Carpathians and up to the Carpathian bend.

The Tertiary Pleistocene volcanic cycle, triggered in the peripheral area of the Carpathian orogen, migrated towards the east, as the lava dating process has shown. As a result, there have been observed a couple of tectonic and volcanic stages, whose ages depend on the movement towards the east of the volcanic eruptions, which in time, produced rhyolites-andezite – basalts from those alkaline to those sub alkaline with specific associated mineralization [17]. As a result of this activity we can distinguish an acid type of volcanism (Hungary, Slovakia, Ukraine), represented by rhyolites, especially in the Zemplin region, in eastern Slovakia and Svidovec Mountains in Ukraine; then we can also mention an intermediary type of volcanism, beginning with the below-average Lower-Middle Badenian, characterized by andesite and dacite rocks, initially submersed, but which gave birth to the volcanic cones of Tisovec and Vihorlat (Slovakia), as well as those from Romania; last but not least, we should mention the basic type of volcanism, where basalts are predominant, in the northern part of Hungary, eastern Slovakia, as well as Perşani mountains, with less important morphological results, because neovulcanism overlapped with older mountain areas. In this geopark, the volcanic complex of Racoş, Olt valley, Bogata, Comana, Hoghiz, issues appearances as well as the Rupea neck are the most representative.

If the Mesozoic magma produces minor intrusions, without any important consequence on the landscape morphology, the sedimentary cover and the Neozoic magma produced an unusual and attractive morphology, even if it does not impress through its size [14]. This is the reason why, there is a wide number of naturally protected areas into this region.

3. A Persani Geopark – an original complex of natural protected areas

Perşani Mountains can be described as a low mountainous area, with an altitude which rarely exceeds 1 000 m high (Măgura Codlei 1 292 m, Cetăţii Peak 1 104 m). Their lithological diversion is extremely remarkable, giving opportunity to a great variety of geosites and geomorphosites, which are extremely attractive both from a scientific and landscape point of view. We notice some forms of geomorphologic patrimony (picturesque isolated cliffs, forms of relief looking zoomorphic, canyons, gorges, caves), geological heritage (basalt columns, basaltic
schoria fossiliferous outcrops) and mixed patrimony (muddy volcanoes). Given their large number (16 nature reserve) they can be grouped as follows:

- **Geological reserves** (the basalt columns of Racoș, volcanic structures of Hegheș Hill), where the main objective is that of the scientific dating of these structures, as well as the protection of the specific geomorphosites. Paleontological reserves, scientifically important fossiliferous sites: the Carhaga fossiliferous site, olistolith marl and limestone, with fossil ammonites; the Ormeniș fossiliferous site, already enjoying national prestige, has also become internationally famous due to its inoceram fauna;

- **Geomorphological reserve** (Hoghiz micro-canyon, Valea Mare gorge – Dopca, Piatra Ciopliță, from Comana);

- **Speleological reserve** (Bârlogul Ursului cave, Apața village);

- **Ornithological reserve** (the swamps at Cotul Turzunului) through their position along the Transylvanian migration lines, represented an important halting place during the migration and nesting periods [12];

- **Landscape reserve** (Pădurea Bogatei, 8500 ha, along DN13, for 16 km, from the Cabana Vânmătorul halting place, up to Izvorul Ursului, on the Măieruș Valley).

Not incidentally, a large part of the geomorphologic landscape and geological patrimony in this mountain area has been protected from the interwar period of the last century.

The Romanian-French academic exchanges, having as a main topic of interest the capitalization of the protected natural habitats through tourism, which we attended (Sorbonne-Paris, Université de Reims Champagne-Ardenne, Université de Nice “Sophia Antipolis”), gave us the opportunity to understand different forms of organization and practice of tourism, in these specific areas. For this reason, our initial focus was on French Regional Natural Parks, which, in spite of the large amount of nature reserves and monuments, as well as archaeological sites, they also comprise wide areas with traditional agricultural uses and their organizational structure does not forbid the tourist access, but regulates it. Based on the field research, the socio-genesis responsibilities become more and more evident, together with the institutional involvement needed to create a network of regional nature parks, which is also supported by the important financial interest in their capitalization. For our first research-proposal, of setting up a Natural Regional Park in Perșani Mts. [2], we had as a model the natural regional parks that we have visited on the above mentioned occasions: “Montagne de Reims” (Champagne-Ardennes,1976), “Luberon” et Queiras” (Provence-Alpes-Côte d’Azur, 1997).

More than that, the research contract, signed with the Brașov county council, that we have accomplished during a two year period, allowed us to elaborate a set of arguments which have been supported in front of the representatives of probably
the most important institutional organization, the Environment Committee of the Braşov county local council [3].

The approach that we had, during the last couple of years, towards the establishment of a geopark in the Perşani Mountains, included a series of conferences, on an international academic level (Bucharest 2004, 2005; Oradea, 2006; Gent 2006; Savona 2007; Gheorgheni, 2008, 2009, 2010; Cairo-Serabit 2008; Paris, 2009; Braşov, 2010. Our research has been supported financially by tree major projects: a Braşov County Council Project, 1997-1998 [9-10]. These studies, which have been evidenced by articles [4-5]; [7]; [11]; chapters in books [8], manuscripts [3]; [9-10] have offered enough argumentation to support the capitalization of the geological, geomorphological, bio-geographical and cultural heritage of Romania, due to become reality in December 2010, when The Perşani Geopark will finally signed and opened.

3.1. Short history of establish „Perşani Geopark”

- June 2007 – The authors presented the idea of establish a Perşani Regional Park after the the French model (Romanian American university, Gand);
- 2008 – Geopark in the Perşani Mountains and recognision the geomorphosites inside, at the meetings with local authorithies (Braşov County Council – Şinca Nouă), national and international conferences, published papers.
- June 2009 – a new presentation at the Braşov County Council;
- August 2009 – a local NGO was created – “Perşani Geopark” Association
- January 2010 – a partenership was signed between the authors of this paper and PGA;
- 2009-2010 – PGA, organise meetings with researchers (from universities and research institutions) and involves administration at local and national level in presented the project to mass media in order to get support in obtaining the official status and establish a new geopark in Romania (in Braşov, Bucureşti etc.);
- Participation to the European Week of Geoparks (May, 2010) for: promotion the network; conservation activities of geological patrimony; geotourism and ecotourism products inside and outside the geopark; education initiative.

4. Reasons for the establishment of the “Perşani” Geopark

- The idea of defining the geomorphosites in relation with geotourism is recent in Romanian literature (geological, geomorphological, tourism);
- The contact with italian geomorphologists [15-16] in the framework of yearly bilateral symposiums (romanian-italian) and multilateral (italian, franche, belgians ) and also Chinese [19];
- A new direction of research issued in the 5th International Conference of Geomorphology at Tokyo (September 2001), the working group Geomorphological Sites: research, assessment and improvement was created;
- Joint Geomorphological Meetings: Italy-Romania-Belgium-France Greece: Gant (Belge-2006); Savona (Italy-2007); Porto Heli, Greece, 2009; Sinaia, 2010;
Of French Groupe of Geomorphology in Paris, June 2009;

Many paper presentations underline the importance from theoretical and practical point of view and many case studies for a variety geographical regions (included Romania).

The Geoparks are organized according to a set of regional institutional [15-16]. They are different from the ones defined by the IUNC (International Union for Natural Conservation), as protected natural areas, due to the further local natural potential, offered by the mountain area of the Perşani Mountains. Practically, the natural protected areas, having a large geological, geomorphological, botanical, hydrological, landscape and fauna potential, are among the oldest in the Romanian Carpathians. We should also mention the fact that besides our scientific research activity into the protected natural areas from the region (the tree project mentioned above) we were able to establish a partnership with the Perşani Geopark Association (an NGO from Racoş), and together we improved the complimentary character of the park, by including a few archaeological sites, as well as buildings having an important architectural value [12]. Besides the famous Racoş, Rotbav, Homorod Baths, Hoghiz (there are some objections because of the cement factory), the most representative is Rupea Fortress, positioned on the site of a major morphosite, called Piatra Cohalmului, a basalt neck in the Târnavelor Plateau.

5. “Perşani” Geopark on a national and European level

The establishment of a geopark, in the Perşani Mountains is considered mandatory, as a result of the existence, in the respective area, of a considerable number of geologic and geomorphologic sites [6]. Compared to our proposal, which restricted the park only to the mountain areas of the Perşani Mountains, together with the members of the Perşani Mountains Association in Racoş, we decided that the limits should be altered (fig.1). There have been included in the map, those areas containing a neck of the Hârtibaci plateau (Cohalm Hill from Rupea), and other areas, from the northern part have been excluded, more exactly the areas belonging to Covasna and Harghita Counties. At the same time, the target of the geopark has been diversified, including also the geoarcheological sites, fortified religious monuments in a multicultural region; areas belonging to different biotypes, etc. At the same time, a special attention has been given to the Racoş geological complex (the volcanic scoria, lapilli and bombs, the Hegheş Mount crater, which had been fragmented by the last explosive volcanic eruptions, as well as the Racoş basalt columns) without forgetting the fossiliferous points at Carhaga and Ormeniş, the basalt columns from Piatra Cioplita (Comana de Sus), the micro-canyon of the Hoghiz basalt, to mention only those elements connected to the Perşani neo-volcanic area [13].

The European geopark network was built in 2000 in partnership with UNESCO – Earth Sciences Division. The main purpose of this network is to support a sustainable development in the rural areas, by promoting the geological heritage as
the basis of a specific geotourism, with adequate aspects of the same goal. In Romania, a member of the European Geopark Network, there is only one national geopark, “Dinosaurus Geopark” (Dwarfs Dinosaurs unique in the word and a Pterosaurus – Hatzegopteryx)) located in “Hâţeg Country” (HG 2151/2004) the 22nd from 30 of European Network [19]. On the same occasion, has been confirmed the uniqueness and importance of the geological heritage of the Perşani region, stressing at the same time the opportunity for accessing European funds for the protection and sustainable development of the reserve and rural communities in the neighborhood. Our partners, the local administration of the geopark, and the European geopark network, have been trained for the selective accommodation of the forms of tourism which can fit into the European frames, regarding the protection and preservation of the geomorphosites and geosites, contributing this way to the sustainable development of the rural areas in the neighborhood (Table 2).

Table 2 Local communities inside the Perşani Geoparc (January, 2010)

Source: INS, 2010

<table>
<thead>
<tr>
<th>Community</th>
<th>Number of Inhabitants</th>
<th>Community</th>
<th>Number of Inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homorod</td>
<td>2300</td>
<td>Apaţa</td>
<td>3256</td>
</tr>
<tr>
<td>Racoş</td>
<td>3445</td>
<td>Măieruş</td>
<td>2815</td>
</tr>
<tr>
<td>Hoghiz (Dopca, Cuciulata)</td>
<td>5158</td>
<td>Feldioara (Rotbav)</td>
<td>7020</td>
</tr>
<tr>
<td>Comana (Comana de Sus)</td>
<td>2751</td>
<td>Hâлечiu</td>
<td>4723</td>
</tr>
<tr>
<td>Pârâu (Veneţia de Sus)</td>
<td>2163</td>
<td>Crizbav</td>
<td>2426</td>
</tr>
<tr>
<td>Şercaia Şînca (Perşani)</td>
<td>3126</td>
<td>Dumbrăviţa (Vlădeni)</td>
<td>5040</td>
</tr>
<tr>
<td>Augustin</td>
<td>1755</td>
<td>Codlea</td>
<td>24643</td>
</tr>
<tr>
<td>Ormeniș</td>
<td>2115</td>
<td>Zârnești</td>
<td>25724</td>
</tr>
</tbody>
</table>
Demographic aspects. The communities inside the park are small rural areas (1700-7000 inhabitants for a commune – 24 villages in 16 commune) and small towns (Zărnăştii and Codlea about 25 000 inhabitants each). We can underline some features: aged population; villages marked by international migration of young population (negative and positive); decreased the agriculture activities; increasing ecotourism activities as a result of understanding as an alternative source of incomes.
In this communities around the Perşani Mountains, the number of establishments providing tourism services (pensions, motels, inns, hostels and camping grounds) is increasing (there are 25 units), but still insufficient to maximize the potential of the region.

### 5.1 Geopark valorisation

- A comprehensive documentation in line with the prospects of developing educational tourism as well as other forms of tourism here will be to the benefit of the settlements around Perşani Mountains. It will have serious chances of competing for LIFE projects for Romania, with EU co-financing, together with Haţeg Geopark, a role model for our country [20].
- The diversity of protected elements represents serious grounding for setting up a cross-county geoparks;
- Its valorization would justify the organization of alternative tourism (geotourism) and educational activities, for which we have the accessibility premise (Codlea facility; Racoş fortress);
- The introduction of the Perşani Mountains geopark in the ecotourist flow of protected areas in Braşov, Harghita and Covasna counties will also facilitate the development of alternative tourism forms (proposed horse riding);
- Thus in the summer, tourists would be able to take up mountain biking, rock-climbing, hiking, rafting on the river Olt, whereas in winter – cross-country skiing on cross-section trails. Proposed mountain biking trails, although across the mountain axis, have a low-to-average degree of difficulty: Baraolt-Doboşeni-Vârghiş (9 km); Vârghiş – Mereşti (23 km); Vârghiş-Ocland (15 km); Baraolt-Augustin (6 km), (rafting access on the river Olt till Racoş, 11 km and the Carhaga fossiliferous site 4 km); Augustin-Ormeniş-Apaţa (16 km, with access to the fossiliferous site and the Bear Lair Cave – Bârlogul Ursului); Mâieruş-Hoghiz (23 km), (with access to Racoş, 12 km and Turzun Bend, 7 km); Hoghiz-Comăna – Piatra Cioplită – Comana Cave (21 km), and if they add up on a steeper profile to Izvorul Ursului (the Bear Spring) in Bogata Forest, another 17 km.

### 5.2 The main objectives of the “Perşani” Geopark:

Conservation of the natural values; Revigoration of traditional activities; The encouragement of development an ecological agriculture; Promotion of valuable natural products as uni brands; Promotion of sustainable development forms of tourism as: geotourism, ecotourism, rural tourism, agrotourism and cultural tourism; Education and Information programs – for local communities; Support for conservation-restauration projects of all historical and cultural monuments; Support for infrastructure development projects in natural protected areas; Recognition of the geomorphosite statues.

### 6. An educational destination

Given the main purpose of the park, we have proposed that the “Perşani” Geopark should be promoted as the “ideal” tourist destination, both for educational
and leisure activities. The education focused on the protection of the environment is a real benefit for sustainable tourism, which we hope to accomplish with this park. Out of the 16 reserves, 12 of them present a highly scientific and educational value, having as a main target not only young people, but also adults, who are strongly connected to the sustainable development local programs. The target groups of the project include students of different age, focused also on adults who can appreciate the scientific and landscape value of the heritage.

The educational activities can be performed on different levels, according to the categories of tourists in the geopark: from the secondary to the university degree, continuing to the educational level target and up to the level of understanding of adult people. As a result, the specialized literature which the tourists will find in the two museums (Racoș and Codlea Strand) will correspond to the needs of each group. The teaching material will be managed by a single person, with an adequate training, while the monitoring of the educational activity will be supervised by a partner belonging to the ultimate educational institution, on a county level. As part of this collaboration, we will settle the key principles of the geopark management plan, as well as the future activities of our partners.

The management plan will focus on developing tourism and alternative educational activities, for the rural areas, which are similar to those appearing in other European geoparks. That is why we need a strong partnership with the managers of other European geoparks, so that we could achieve the scientific support and high quality international standards. As in the case of other geoparks, we need exchange of information, regarding the present day situation and level of tourist services to be promoted, compared to those of other geoparks, members of the Geoparks European Network, as part of a larger “tourist offer research”.

Our study also assessed the essential contents of the teaching material, necessary for promoting educational tourism. As a result, we will promote both common tourist packages and specific packages of scientific teaching material, in order to develop these types of alternative tourism. Furthermore, the new technologies, such as video conferences, the Internet, will be used for a better promotion of the product on the market. The teaching instruments, differentiated on specific educational levels, starting from the secondary school and up to the university level, will be available to all categories of tourists, starting from tourist guides, maps and fliers and leaflets. Among other promotional tools we can mention: website, which should contain modern, and continuously updated information on the geopark site; tourist information points, equipped with promotion boards, which will be placed in the main Perșani (Racoș) tourist information centre; fliers and posters informing tourists about the educational programs and geotourist activities which the park can offer; folders about the European Geopark Network, which will be published in four different European Union languages; multimedia presentation on a CD-ROM.

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7. Conclusions

For more than half a century, in the mountain area of Braşov, tourism has been determined by people’s interest in nature and forms of relief with attractive structure and aspects, even if during those times it didn’t bear the name of geotourism. Here appeared the first organizations of nature and mountain lovers, the real pioneers of ecotourism, which is the best approach or policy, for development on a local or county level.

Cultural tourism can be associated with the educational tourism, promoted by this geopark, the old settings of Codlea, Rupea, Racoş, Hoghiz, Homorod Băi, which are included in the tourist routes, being the preservers of old monuments (fortified churches, fortresses, defense walls). We can also talk about a multicultural tourism, as the multiethnic households and traditions, specific to different populations (Romans, Germans, and Hungarians) can be found everywhere. That is why rural tourism and agrotourism are very well developed on the outskirts of Perşani Mountains, and in the hill area of the Transylvania Plateau.

Nowadays, when we have acknowledged Piatra Craiului National Park and Bucegi Natural Park (in the vicinity), the principles of ecotourism became to be known both by those taking care of the protected area, but also by the tourists. Less by the local people, who consider this a kind of constraint (the fact that they are no longer allowed to exploit the forest and natural resources, as well as extend the construction space around the naturally protected areas). That is why, with the foundation of the Perşani Geopark, the information offices will be also used for the local inhabitants training programs. All these could become the paths to be followed by a cohesive group, which could ensure the sustainable development of tourism in the local communities.

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