VEGETATION OF CALCAREOUS AND CALCSHIST SCREES AND LIMESTONE SLOPES FROM THE GEOPARK PLATEAU MEHEDINŢI (ROMANIA)

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Abstract. This paper presents three natural habitats: 8120 Calcareous and calcshist screes of the mountain to alpine levels (*Thlaspietea rotundifolii*), 8160* Medio-European calcareous screes of hill and mountain levels, and 8210 Calcareous rocky slopes with chasmophytic vegetation from the Geopark Plateau Mehedinți. The presentation used as diagnostic elements: the code and name NATURA 2000, correspondence with the Romanian habitats, EMERALD, CORINE, PALAEARCTIC HABITATS, and EUNIS classification, general description, stationary particularities, variability and distribution in the territory, phytosociological correspondence, physiognomy and structure, contact habitats, ecological and biological value. It also presents the habitat status, the disturbing factors, the potential threats and the management.

Keywords: natural habitats, Mehedinți, Oltenia, Romania.

Rezumat. Vegetația grohotișurilor și versanților stâncoși calcaroși din Geoparcul Platoul Mehedinți (România). Articolul prezintă trei habitatenaturale: 8120 Grohotişuri calcaroase şi de şisturi calcaroase din etajul montan până în cel alpin (*Thlaspietea rotundifolii*),8160* Grohotişuri medio-europene carbonatice din etajele colinar şi montan şi 8210 Versanţi stâncoşi calcaroşi cu vegetaţie casmofitică. Prezentarea utilizează ca elemente de diagnoză: cod și nume NATURA 2000, corespondență între habitatele românești, EMERALD, CORINE, PALAEARCTIC HABITATS și EUNIS, descriere generală, particularități staționale, variabilitate și distribuție în teritoriu, corespondențe fitosociologice, fizionomie și structură, habitate în contact, valoarea ecologică și biologică. Se prezintă, de asemenea, starea habitatelor, factorii perturbatori, amenințările potențiale și cadrul de management.

Cuvinte cheie: habitate naturale, Mehedinți, Oltenia, România.

INTRODUCTION

The studied area is represented by the limestone areas from the Geopark Plateau Mehedinți. The limestones of Jurassic-Cretaceous age belong to the Danubian Autochthonous and are arranged in two main parallel strips. The western strip belongs to Mehedinți Mountains and is characterized by a very strong tectonics. The fall in steps, westward, has formed the Cerna graben. The eastern strip appears in the central part of Mehedinți Plateau, between Baia de Aramă and Cireşu. The limestone has a thickness of 200-300 mand consists of the 4-10 m thick layers with southeastern general inclination. The layers of limestone, which occupy only about 5% of the total surface, have generated a great diversity of karstic phenomena. The limestone hillocks mark the Jurassic limestone alignment of the Danubian Autochthonous, developed in the northeast-southwest direction. When crossing the strip of limestone, the rivers formed gorges where depression areas developed in time; the most important are represented by the Bahna - Baia de Aramă depression corridor: Bahna, Cireşu, Balta, Isverna, Nadanova, Obârşia Cloşani. At present, almost all the rivers that come from the west, from impermeable formations, are captured in the underground the entrance of limestone strip.

MATERIAL AND METHODS

The researches concerning the inventory of the natural habitats were performed in 2010-2013. The study methods are the classical ones.

In order to identify and characterized the habitats we used the methodology proposed by CRISTEA et al. (2004), DONIŢĂ et al. (2005, 2006), GAFTA & MOUNTFORD (2008).

The presentation used as diagnostic elements: code and name NATURA 2000, correspondence with the Romanian habitats, EMERALD, CORINE, PALAEARCTIC HABITATS, and EUNIS classification, general description, stationary particularities, variability and distribution in the territory, phytosociological correspondence, physiognomy and structure, contact habitats, ecological and biological value. It also presents the habitat status, the disturbing factors, the potential threats and the management.

There have been used previously published data related to this type of vegetation (MALOŞ & FIRESCU, 1971; MALOŞ, 1976; MĂGĂLIE, 1970; POPESCU et al., 2006; POPOVA-CUCU, 1970, 1971; POPOVA-CUCU & POPESCU, 1975), previously published data by the authors of this article, related to the flora of the Geopark (CIORTAN & NEGREAN, 2012; NEGREAN & CIORTAN, 2012, 2013), and data from the Final Report 2007. We also used National Red Lists: BOŞCAIU et al., 1994; DIHORU & DIHORU, 1994; OLTEAN et al., 1994. Generally, the nomenclature of the species was given after Flora of Romania (SĂVULESCU, 1952-1976), Flora Europaea (TUTIN et al., 1964-1980; TUTIN et al., 1996).

RESULTS AND DISCUSSIONS

Habitat 8120 Calcareous and calcshist screes of the mountain to alpine levels (***Thlaspietea rotundifolii***), represented in the area by the Romanian habitats R6111 Southeastern Carpathian boulders community fixed with *Geranium macrorrhizum, Sedum fabaria* and *Geranium lucidum*, R6113 Southeastern Carpathian screes community fixed with *Parietaria officinalis, Galium lucidum* and *Geranium lucidum* which **corresponds to the European classification systems** as it follows: EMERALD - 61 Screes; CORINE - 61 Screes; PAL. HAB. - 61 Screes; EUNIS H2 Screes.

General description. The characteristic vegetation of the habitat develops on limestone screes and boulders; the edifying and characteristic species are the pioneers of the vegetation installed on the land resulting from the accumulation of rock debris. Installation is conditioned by the boulders size, exhibition, tilt walls, altitude, etc.

Stationary particularities. They are installed on the coarser limestone screes mobile, semifixed or fixed, on the old, fixed massive limestone boulders, in shady or semi-shaded places. The soils are skeletal rendzinic, moist and rich in humus or lythosols. Altitudes are between 400 and 1100 m.

Phytosociological correspondence, **variability and distribution in the territory**:

- R6111 Southeastern Carpathian boulders community fixed with *Geranium macrorrhizum, Sedum fabaria* and *Geranium lucidum*, edified by as. *Geranietum macrorrhizi* Boşcaiu 1971, are represented in the study area by saxicolous phytocoenoses located at the base of the semi-shaded slopes of the intra-mountainous valleys, on steep slopes, massive boulders, old, fixed, sunny or semi-shady slopes with southern, eastern or northern exposition. They have been identified in many choronyms in the Geopark, the most important being at Camena, Pădurea Vârtoape, Coşuştea, Pietrele Albe, Potcoava (Isverna), Valea Domnişoarelor, Găurinţi (exit toward La Varniţe – footpath from ”sesleriete”).

- R6113 Southeastern Carpathian scree community fixed with *Parietaria officinalis, Galium lucidum* and *Geranium lucidum* edifyed by as. *Parietarietum officinalis* Csűrös 1958 (syn. *Parietarieto - Geranietum lucidi* Gergely et al. 1966, *Parietarieto - Galietum lucidi* Boşcaiu et al. 1966), occupies small surfaces of no more than 6-7 m^2, on the slopes with southeast exhibition, in direct sunlight or on the outskirts of the beech forest. Such phytocoenoses have been identified at Ogaşul lui Beniog and Pietrele Albe.

Physiognomy and structure

a) R6111 Southeastern Carpathian boulders community fixed with *Geranium macrorrhizum*, *Sedum fabaria* and *Geranium lucidum*

The phytocoenoses are composed of herbaceous species; the edifying species is *Geranium macrorrhizum* and characteristic species are: *Geranium lucidum, G. macrorrhizum, S. maximum,* alongside whom meet: *Acinos arvensis, Allium flavum, Arabis alpina, Asplenium ceterach, A. trichomanes* subsp. *quadrivalens, A. ruta-muraria, Astragalus glycyphyllos, Arabis turrita, Aurinia petraea, Campanula grossekii, Cardaminopsis arenosa, Cerastium banaticum, Clematis vitalba, Cystopteris fragilis, Delphinium fissum* subsp. *fissum, Festuca rupicola, Galium album, G. robertianum, Koeleria macrantha, Jovibarba heuffelii, Lactuca viminea* subsp. *viminea, Lamium maculatum, Lunaria annua* subsp. *pachyrhiza, Melica ciliata, Mercurialis ovata, Micromeria pulegium, Moehringia muscosa, M. pendula, Origanum vulgare, Ornithogalum orthophyllum* subsp. *kochii, Parietaria officinalis, Petrorhagia saxifraga, Poa nemoralis, Saxifraga paniculata, Scabiosa columbaria* subsp. *columbaria, Sedum hispanicum, Senecio rupestris, S. vulgaris, Seseli rigidum* subsp. *rigidum, Silene vulgaris, Solidago virgaurea, Thlaspi perfoliatum, T. dacicum* subsp. *banaticum, Verbascum banaticum, Veronica chamaedrys, Vincetoxicum hirundinaria.*

b) R6113 Southeastern Carpathian screes community fixed with *Parietaria officinalis*, *Galium lucidum* and *Geranium lucidum*

The phytocoenoses are composed of herbaceous species and very few woody species (in the phytocoenosis of forest edges), edified by *Parietaria officinalis, Galium lucidum, Geranium lucidum* and characteristic *Parietaria officinalis.* Other species: *Abies alba* (juvenile), *Acer pseudoplatanus* (juvenile), *Bromus squarrosus, Chaerophyllum aromaticum, Clematis vitalba, Fagus sylvatica, Heracleum sphondylium, Origanum vulgare, Polystichum aculeatum, Potentilla recta, Rubus caesius, Senecio vulgaris, Teucrium montanum, Urtica dioica, Verbascum nigrum* subsp. *abietinum, Veronica jacquinii, Viola tricolor.*

Contact habitats: 8160* Medio-European calcareous screes of hill and mountain levels, 40A0* Subcontinental peri-Pannonic scrub, and 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*).

Ecological and biological value – high conservation value – endemic habitat (DONIŢĂ et al., 2005).

The criterion Aiv b corresponding plant species for selected types of Natura 2000 sites: plant species listed in Annex II b - sub-endemic and endangered species - National Red Lists (CR, EN, and V) not included in the Ai, Aii and Aiii categories: *Micromeria pulegium.*

Species from the National Red Lists: *Campanula grossekii, Delphinium fissum* subsp. *fissum, Cerastium banaticum, Galium lucidum, Jovibarba heuffelii, Lactuca viminea* subsp. *viminea, Lunaria annua* subsp. *pachyrhiza, Mercurialis ovata, Petrorhagia saxifraga, Seseli rigidum* subsp. *rigidum, Thlaspi dacicum* subsp. *banaticum*.

Habitat 8160* Medio-European calcareous screes of hill and mountain levels represented in the area by the Romanian habitats R6115 pioneer Daco-Balkan communities of mobile screes with *Achnatherum calamagrostis* the **correspondence of which is the European classification systems is** as it follows: EMERALD – 61Screes; CORINE– 61Screes; PAL. HAB. – 61.311 Rough-grass screes; EUNIS – H2.61 Peri-Alpine thermophilous screes.

General description. Habitat encounteredof the hill and mountain levels extending into the mountainous regions (subalpine and alpine), often in dry, warm stations in associations with *Stipetalia calamagrostis*. Edified by *Achnatherum calamagrostis*, characteristic species: *Parietaria officinalis* and *Thymus comosus.* The phytocoenosis of the association develops fragmentary on very dry land.

Stationary particularities – in the analyzed territory, it is installed on limestone screes semi-fixed on steep slopes with 35-40° inclination, on the lythosols.

Phytosociological correspondence, **variability and distribution in the territory**– represented in the territory by the phytocoenosisof as. *Achnatheretum calamagrostis* Br.-Bl. 1918, identified at Ogașul lui Beniog, Câmpurile de lapiezuri - Ponoarele. As the substrate is fixed and enriched in organic matter, the association evolves towards edification with some groups of the alliance *Alysso-Sedion*.

Physiognomy and structure

The shrubs layer: in some phytocoenoses, there appear rare specimens of: *Crataegus monogyna*, *Fraxinus ornus*, and *Pinus nigra* subsp. *banatica* (juvenile), *Syringa vulgaris*.

The herbaceous layer: *Acinos arvensis, Asplenium ruta-muraria, A. trichomanes* subsp. *quadrivalens, A. viride, Arabis procurrens, Aurinia petraea, Cardaminopsis arenosa, Cephalaria laevigata, Clematis vitalba, Dianthus petraeus, Erysimum odoratum, Festuca rupicola, F. xanthina, Galium album, G. purpureum, Geranium macrorrhizum, G. robertianum, Linum catharcticum, Melica ciliata, Moehringia muscosa, Origanum vulgare, Phleum montanum, Poa nemoralis, Galium purpureum, Parietaria officinalis, Petrorhagia saxifraga, Scrophularia heterophylla* subsp. *laciniata, Teucrium chamaedrys, T. montanum, Thymus comosus, Verbascum nigrum* subsp. *abietinum, V. speciosum*.

Contact habitats: 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*), 9150 Medio-European limestone beech forest of the *Cephalanthero-Fagion* and 8120 Calcareous and calcshist screes of the mountain to alpine levels.

Ecological and biological value – low conservation value (DONIȚĂ et al., 2005). However, analyzing the floristic composition of habitat we believe that, at least in the investigated area, its conservation value is high.

The criterion Aiii corresponding plant species for selected types of Natura 2000 sites: endemic and endangered species – National Red Lists (CR, EN, and V), not included in the Ai and Aii categories: *Pinus nigra* subsp. *banatica*.

The criterion Aiv b corresponding plant species for selected types of Natura 2000 sites: plant species listed in Annex II b - sub-endemic and endangered species - National Red Lists (CR, EN, and V) not included in the Ai, Aii and Aiii categories: *Cephalaria laevigata.*

Species from the National Red Lists: *Festuca xanthina, Galium purpureum, Petrorhagia saxifraga, Thymus comosus.*

Habitat 8210 - Calcareous rocky slopes with chasmophytic vegetation – represented in the area by the Romanian habitats R6111, which corresponds to the **European classification systems** as it follows:

- R6209 Southeastern Carpathian community on limestone rocks with *Asplenium trichomanes* subsp. *quadrivalens* and *Poa nemoralis*: EMERALD - 6 Inland rocks, screes and sands; CORINE -62 Inland cliffs and exposed rocks; PAL. HAB. - 62 Inland cliffs and exposed rocks; EUNIS - H3 Inland cliffs and exposed rocks habitats.

- R6216 Daco-Balkan communities on limestone rocks with *Asplenium ceterach* and *Draba lasiocarpa* and R6217 Daco-Balkan communities on limestone rocks with *Silene saxifraga* subsp. *petraea, Asplenium ruta-muraria* and *Asplenium trichomanes* subsp. *quadrivalens*: EMERALD - 6 Inland rocks, screes and sands; CORINE - 62 Inland cliffs and exposed rocks; PAL. HAB. - 62.1A22 Banat collinear calcareous cliffs; EUNIS - H3.2 Basic and ultra-basic inland cliffs.

- R6218 Southeastern Carpathian community from the cracks of limestone rocks *Asplenium trichomanes* subsp. *quadrivalens* and *Asplenium ruta-muraria*: EMERALD - 6 Inland rocks, screes and sands; CORINE - 62 Inland cliffs and exposed rocks; PAL. HAB. - 62.153 Carpathian calcareous cliff heliophilous communities; EUNIS - H3.2 Basic and ultra-basic inland cliffs.

General description.The habitat includes the vegetation developed in the fissures of limestone cliffs, belonging essentially to the *Potentilletalia caulescentis* with the spreading (hilly)-mountain-subalpine, namely: sciaphilous communities of *Cystopteris fragilis*, *Asplenium trichomanes* subsp. *quadrivalens* and *A. trichomanes* subsp. *ramosum*, xerophilic communities of *Asplenium ceterach* and *A. ruta-muraria* and north-Balkan communities of limestone cliffs (*Micromerion pulegii*). It is characterized by the presence of numerous thermophilic elements of Balkan (Balkan-Illyrian) and Mediterranean origin, which distinguishes them from the rest of the saxicolous phytocoenoses of the Carpathian Mountains.

Stationary particularities – they are installed on limestone (Mesozoic limestones and gneisses), on cliffs or lapis, on slopes with boulders or gravel, on shady rock walls or on the slopes with southern exhibitions, wall with cracks. The soils are rendzinas.

Phytosociological correspondence, **variability and distribution in the territory**:

a) R6209 Southeastern Carpathian community on limestone rocks with *Asplenium trichomanes* subsp. *quadrivalens* and *Poa nemoralis* edified by as. *Asplenio quadrivalenti - Poëtum nemoralis* Soó ex Gergely et al. 1966. Identified at Topolnița Cave (input to Peștera Femeii, at Prosăc), Topolnița Gorges, input to Epuran Cave, Isverna Cave, Turcului Valley, Pietrele Cerbului, Coșuștea Cave. The phytocoenoses are scattered fragments at the edge of the oak and beech forests (e.g. Turcului Valley, Pietrele Cerbului) or come in contact with the woody vegetation of *Orno-Cotinetalia* (e.g. Topolnița, Epuran, Isverna caves, Coșuștea Gorges). There is casmo-comofite groupings that often populate the cliffs of a complex of narrower and wider cracks, lower shelves and smaller narrow paths. Sometimes they look like rocky grasslands, as it is the case of Piatra Cerbului, because they are communities of passage to other plant groupings (grassland or forest).

b) R6216 Daco-Balkan communities on limestone rocks with *Ceterach officinarum* and *Draba lasiocarpa* – edified by as. *Drabo lasiocarpae - Ceterachetum* (Schneider-Binder 1969) Peia 1978. Identified at Topolnița [Topolnița Gorges, Prosăc, Găurinți (footpath from "sesleriete", La Varnițe – *Asplenio-Ceterachetum* Vives 1964 var. reg. *banaticum* E. Schneider-B., BOȘCAIU, 1971)], Coșuștea Gorges, Camena. The phytocoenoses are pioneers and come in contact with *Fraxinus ornus*, *Syringa vulgaris* and *Cotinus coggygria* thickets.

c) R6217 Daco-Balkan communities on limestone rocks with *Silene saxifraga* subsp. *petraea*, *Asplenium ruta-muraria* and *Asplenium trichomanes* subsp. *quadrivalens* edified by as. *Asplenio-Silenetum petraeae* Boșcaiu 1971. As. was first cited in Oltenia by MALOȘ & MALOȘ (1975) from Piatra Cloșanilor (Piatra Mare and Piatra Mică). In the Geopark, it was identified at Pietrele Cerbului. Here *Micromeria pulegium* does not appear. The phytocoenoses come in contact with the as. *Seslerietum rigide moesicum* Zólyomi 1939 subas. *praemoesicum* Zólyomi 1939.

d) R6218 Carpathian community from the cracks of limestone rocks *Asplenium trichomanes* subsp. *quadrivalens* and *Asplenium ruta-muraria* edified by xerophilic – xero-mesophilous phytocoenosis of the as. *Asplenietum rutae-murariae - trichomanis* R. Tüxen 1937. Described by MALOȘ & MALOȘ (1975) from Ponoarele, Obârșia Cloșani, Lupșa Gorges. It has been identified in the territory in many choronyms (Ponoarele, Baia de Aramă -monastery-secondary from walls, Ogașul lui Beniog, Pietrele Cerbului, Pietrele Albe, Camena, Isverna-Potcoavă, Topolnița Gorges).

Physiognomy and structure

a) **R6209 Southeastern Carpathian community on the limestone rocks with *Asplenium trichomanes* subsp. *quadrivalens* and *Poa nemoralis*** – represented by the chasmophytic phytocoenosis with meso-hygrophilic, mesophilic character with a decreased coverage. Characteristic species: *Asplenium trichomanes* subsp. *ramosum* and *Cystopteris fragilis*; alongside there are also encountered: *Achillea crithmifolia, Asplenium ceterach, A. lepidum* subsp. *lepidum, A. ruta-muraria, A. trichomanes* subsp. *quadrivalens, Aster alpinus, Arabis alpina, Botrychium lunaria, Campanula rapunculoides, C. trachelium, Cardamine hirsuta, C. impatiens, Cirsium grecescui, Ctenidium molluscum, Epipactis atrorubens, E. helleborine, Erysimum cuspidatum, Euphorbia cyparissias, Euphrasia illyrica, Fragaria vesca, Galium album, G. aparine, Geranium robertianum, Geum urbanum, Gymnocarpium dryopteris, Hedera helix, Melica ciliata, Moehringia muscosa, M. pendula, Mycelis muralis, Myosotis sparsiflora, Oxalis acetosella, Polypodium vulgare, Polystichum aculeatum, Potentilla argentea, P. micrantha, Primula auricula* subsp. *serratifolia, Saxifraga paniculata, S. rotundifolia, Sedum acre, S. hispanicum, Selaginella helvetica, Seseli rigidum* subsp. *rigidum, Sesleria rigida, Taraxacum erythrospermum, Teucrium montanum, Urtica dioica, Viola canina* s.l., *V. reichenbachii*.

b) **R6216 Daco-Balkan communities on the limestone rocks with *Ceterach officinarum* and *Draba lasiocarpa*** – represented by chasmophytic phytocoenosis, thermophilic, with the characteristic species *Asplenium ceterach*; alongside there are also encountered: *Asplenium ruta-muraria, A. trichomanes* subsp. *quadrivalens, Aurinia petraea, Cerastium banaticum, Cystopteris fragilis, Draba lasiocarpa, Erysimum odoratum, Festuca rupicola, Mercurialis ovata, Moehringia muscosa, Poa nemoralis, Polypodium vulgare, Saxifraga paniculata, Seseli rigidum* subsp. *rigidum, Sedum hispanicum, Silene nutans* subsp. *dubia*.

c) **R6217 Daco-Balkan communities on the limestone rocks with *Silene saxifraga* subsp. *petraea*, *Asplenium ruta-muraria* and *Asplenium trichomanes* subsp. *quadrivalens*** represented by chasmophytic phytocoenosis, xerophilic, occupying vertical rock walls, the southern, eastern, southeastern, and western exposure, sunny (Photo 1).

Photo 1. Walls with *Silene saxifraga* (original).

Photo 2. Detail *Silene saxifraga* (original).

The floristic composition is dominated by *Silene saxifraga* (Photo 2); there are also encountered: *Asplenium ceterach, A. ruta-muraria, A. trichomanes* subsp.*quadrivalens, Athamanta turbith* subsp. *hungarica, Fagus sylvatica, Geranium macrorrhizum, Melica ciliata, Moehringia muscosa, M. pendula, Viola hirta.*

d) **R6218** Carpathian community from the cracks of limestone rocks *Asplenium trichomanes* subsp. *quadrivalens* and *Asplenium ruta-muraria* – represented by chasmophytic phytocoenosis with xero-xero-mesophilous or mesophilic-mesohygrophilic character, with the following floristic composition:

- at Ogașul lui Beniog, on the slopes with southern exposition: *Arabis alpina, Asplenium ceterach, A. ruta-muraria, A. trichomanes* subsp. *quadrivalens, Bromus ramosus, Cephalaria laevigata, Erysimum odoratum, Jovibarba heuffelii, Micromeria pulegium, Moehringia muscosa, Sedum album, Tragopogon balcanicus*; on the south-eastern and northern slopes: *Arabis alpina, Asplenium ceterach, A. lepidum* subsp. *lepidum, A. ruta-muraria, A. trichomanes* subsp. *ramosus, Euphrasia illyrica, Fragaria vesca, Geranium macrorrhizum, Linum catharticum, Melica ciliata, Minuartia hirsuta, Saxifraga paniculata.*

Also, in the 8210 habitats, we include the as. *Seslerietum rigidae moesicum* subas. *praemoesicum* that we identified at Camena, Ogașul lui Beniog (Photo 3) and Pietrele Cerbului (Photo 4), described by MALOȘ & MALOȘ (1974) from Piatra Cloșanilor Mountains (Piatra Mare and Piatra Mică). The phytocoenosis occupies the vertical rock walls (with the eastern exhibition at Pietrele Cerbului and western at Camena). The edifying species is *Primula auricula* subsp. *serratifolia*; there are also encountered: *Arabis alpina, Asplenium ceterach, A. ruta-muraria, A. trichomanes* subsp. *quadrivalens, Aster alpinus, Athamanta turbith* subsp. *hungarica, Aurinia petraea, Campanula rotundifolia* s.l., *Draba lasiocarpa, Festuca xanthina, Dianthus petraeus* subsp. *petraeus, Doronicum columnae, Edrajanthus graminifolius, Euphorbia cyparissias, Leontodon asper, Moehringia muscosa, M. pendula, Pinus nigra* subsp. *banatica, Sambucus racemosa, Saxifraga paniculata, S. tridactylitis, Selaginella helvetica, Seseli libanotis* subsp. *libanotis, S. rigidum* subsp. *rigidum, Sesleria rigida, Silene saxifraga, Solidago virgaurea, Teucrium chamaedrys, T. montanum.*

Photo 3. *Primula auricula serratifolia* in anthesis (original).

Photo 4. *Primula auricula serratifolia* fructified (original).

Contact habitats: 91L0 Illyrian oak hornbeam forest (*Erytronio-Carpinion*), 9150 Medio-European limestone beech forest of the *Cephalanthero-Fagion*, 40A0* Subcontinental peri-Pannonic scrub, 8120 Calcareous and calcshist screes of the mountain to alpine levels.

Ecological and biological value – high conservation value: R6209, R6216 and R6217 are endemic habitats (DONIȚĂ et al., 2005).

The criterion Aiii corresponding plant species for selected types of Natura 2000 sites: endemic and endangered species – National Red Lists (CR, EN, V), not included in the Ai and Aii categories: *Athamanta turbith* subsp. *hungarica, Pinus nigra* subsp. *banatica, Primula auriculata* subsp. *serratifolia, Silene nutans* subsp. *dubia*.

The criterion Aiv b corresponding plant species for selected types of Natura 2000 sites: plant species listed in Annex II b - sub-endemic and endangered species - National Red Lists (CR, EN, and V) not included in the Ai, Aii and Aiii categories: *Cephalaria laevigata, Cirsium grecescui, Micromeria pulegium.*

Species from the National Red Lists: *Asplenium lepidum* subsp. *lepidum, Cerastium banaticum, Epipactis helleborine, Euphrasia illyrica, Festuca xanthina, Jovibarba heuffelii, Mercurialis ovata, Seseli rigidum* subsp. *rigidum, Silene saxifraga, Teucrium montanum, Tragopogon balcanicus.*

CONCLUSIONS

1. Habitats 8120 Calcareous and calcshist screes of the mountain to alpine levels (*Thlaspietea rotundifolii*) and8210 - Calcareous rocky slopes with chasmophytic vegetation are endemic habitats with high conservation value from the Geopark territory.

2. Habitat 8160* Medio-European calcareous screes of hill and mountain levels - priority habitat - is very rare in the Geopark, identified only in the two choronyms.

3. The status of this habitat is favorable in the examined area. There have not been identified potential threats to the habitat, there have not noticed any parasitic fungi attacks.

4. The disturbing factors of such habitats are represented by uncontrolled tourism and quarrying, but the presented phytocoenoses are not affected by such factors. Management measures may be imposed as appropriate, depending on the disturbing factors.

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