

## Nemoral habitats from Geopark Plateau Mehedinți (România)

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**Abstract** This paper presents four nemoral natural habitats from Geopark Plateau Mehedinți: 9110 *Luzulo-Fagetum* beech forests, 9150 Medio-European limestone beech forests of the *Cephalantherion-Fagion*, 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*) and 91L0 Illyrian oakhornbeam forest (*Erytronio-Carpinion*). The research was conducted with the occasion of monitoring of species and habitats from Geopark Mehedinți Plateau, the purpose of improving management to achieve the biodiversity conservation objectives. The presentation used as a diagnostic elements: code and name Natura 2000, correspondence with romanian habitats, EMERALD, CORINE, PALAEARCTIC HABITATS, and EUNIS classification, general description, stationary particularities, variability and distribution in the territory, phytosociologic 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.

### Key words

nemoral habitats,  
Mehedinți, Oltenia,  
România

At European level, habitat typology was preceded by actions under project CORINE (Coordination of Informations on the Environment), which started from the premise that, for biodiversity conservation and saving species from extinction, it is necessary to keep, in the first instance, their habitats.

Monitoring the "health status" of habitats, in particular of the Natura 2000 habitats, is a requirement imposed by the accession of Romania to the European Union and the implementation of the Natura 2000 network in our country. From these considerations, Geopark Plateau Mehedinți Administration has proposed monitoring habitats and species in the area. Therefore, runs *Biological and geological resources management at European level and public awareness from Geoparc Plateau Mehedinți* project, which has as first activity monitoring species and habitats in order to improve management and biodiversity conservation objectives.

Regarding the history of botanical research in the area the first plants of the Geopark Mehedinți were published by Borbás 1876, 1878 [3, 4], afterwards by the Dimitrie Grecescu [21, 22] which passed through the current Geopark before the 1898, on his way to Mount Godeanu. Between 1963 and 2004, only 2 or 3 papers were dedicated to the Geopark, especially on the vegetation of the Lilac Forest in Ponoarele [25, 26, 28, 33, 34, 35, and 36]. Sporadic data scattered throughout the Romanian literature emerged from occasional trips in the region [2, 25]. In 2012 and 2013 were published several papers relating to the flora of Geopark [8, 9, 10, 11, 12, 13, 14].

**The studied area.** Mehedinți Plateau is represented by two units of relief (hills and plateau) placed between Mehedinți Mountain ridge to the west and the Getic Piedmont to the east. However, the relief is much closer to the mountains not only the structure and rocks but also through the evolution of the relief. The hilly unit is in the vicinity Mountains Mehedinți (the hills between Moisești until Mălărișca and the hills of Isverna), while the plateau occupies the Cosuștea hills.

Between the plateaus unit (east) and the depression area (center) can be define another morphological unit, namely the limestone cornets, which marks the Jurassic limestone's alignment of the Danubian Autochthonous, developed in the NE-SV direction. The most impressive and most popular cornets are: Cerboanii (810 m), Babelor (770 m), Bălții (701 m), Piatra Încălecată, Obârșia Cloșani. When crossing the bar of limestone, the rivers forming keys behind them runs depression areas; the most important are the Bahna-Baia de Aramă depression corridor: Bahna, Cireșu, Balta, Isverna, Nadanova and Obârșia Cloșani depressions.

The forests occupy the NE part of the Plateau and just keeps better in the eastern part of the Plateau (after Meilescu et al. 2004 [27]). In the Cosuștea area were made more deforestation, and for deforested place was planted the spruce and black pine. The forest surfaces of beech, fir and pine still remained unaffected by cutting on the valleys of Crivei, Lăpușnic (tributaries of the Cosuștea) and Borovăț (tributary of Topolnița). In the south-west part of the Plateau can be found downy oak forests, hornbeam, and lime. On the

Coșuștea and Topolnița valleys occurring abundant deciduous thickets (schibljak).

The Natura 2000 site Mehedinți Plateau (ROSCI0198) overlaps with the northwestern half of the Geopark Plateau Mehedinți (fig. 1), whose limits are presented by Meilescu et al. 2004 [27]. Here the forests are represented by the pure or mixed beech forests, hornbeam and oak (*Quercus dalechampii*) forests, which constitutes in the nemoral habitats for which the site was designated: *Luzulo-Fagetum* beech forests, Medio-European limestone beech forest of the *Cephalanthero-Fagion*, Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*), Illyrian oak-hornbeam forests (*Erytronio-Carpinion*) and *Tilio-Acerion* forests of slopes, screes and ravines.

## Material and Methods

Researches concerning the inventory of the natural habitats were performed in 2010-2013.

To define the objectives of the monitoring plan were analyzed information published in the final report of the management plan *Evaluation of biological diversity and conservation status in order to achieve the Natura 2000 database of Geopark Plateau Mehedinți*, ecological studies, floristic inventory, vegetation studies, vegetation, edaphic geologic and topographic maps [43]. Also, were analyzed the listing of the species and phytocenologic listings made subsequent to own research over the years 2010-2013.

In order to identify habitats have been used *Habitats from Romania* [18, 19] and *Interpretation Manual of Natura 2000 habitats in Romania* [20]. We performed a Level III monitoring which applies only to priority habitats and effectively capitalizes data collected on the field [7]. We chose the random sample of habitats, because it implies that each point of the surface considered having equal opportunity to be elected during a survey [1, 23, and 24]. The permanent sample surfaces (for most habitats) were combined with temporary ones for some habitats located at higher altitudes and areas with poor accessibility. The size of the sample surface was proposed by the school of Cluj [15]. Number of sample surfaces necessary for monitoring of habitats has depended on the area occupied by it in the study area, and the structural complexity and its spatial variability.

National Red Lists used: Boșcaiu & al. 1994 [6]; Dihoru & Dihoru 1994 [16]; Oltean et al. 1994 [34] and *Red Book of vascular plants from România* [17].

Generally, nomenclature species, after Flora Romania (Săvulescu 1952-1976) [39], Flora Europaea (Tutin et al. 1964-1980, Tutin et al. 1996) [41].

The presentation used as diagnostic elements: code and name Natura 2000 [20], correspondence between Doniță et al. (2005, 2006) [18, 19], EMERALD, CORINE, PALAEARCTIC HABITATS, and EUNIS classification, general description, stationary particularities, variability and distribution in

the territory, phytosociologic correspondence, physiognomy and structure, contact habitats and associated dynamic (habitats that may confuse), ecological and biological value. It also presents the condition habitat, the disturbing factors, the potential threats and the management.

## Results

**Habitat 9110 *Luzulo-Fagetum* beech forests** – represented by Romanian habitat R4110 Southeast Carpathian beech forests (*Fagus sylvatica*) with *Festuca drymeja*, whose **correspondence with European classification systems** are the following: EMERALD - !41.1 Beech forests; CORINE - ; PAL. HAB. - 41.1D54 South Carpathian *Festuca drymeja* beech forest; EUNIS - G1.6D54 South Carpathian *Festuca drymeja* beech forest.

**General description** – is represented by the beech forests belonging to *Fagetalia sylvaticae* Pawłowski in Pawłowski et al. 1928 class: the hilly medio-European beech forests with *Luzula luzuloides*, dominated by *Fagus sylvatica* and having characteristic species *Festuca drymeja*.

**Stationary particularities** – develops medium to strongly inclined slopes, with various exhibitions or on the crests; the substrate is composed of limestone rocks, calcareous sandstones, conglomerates and Mesozoic magmatic intrusions; deep brown forest soils, with much gravel and moderately acidic soils, mesobasic strongly, podsollic, poor in humus.

**Phytosociologic correspondence, variability and distribution in the territory.** Represented by:

- phytocenosis of as. *Festuco drymejae-Fagetum* Morariu et al. 1968 - pure beech forests installed on mean slopes or crests where *Festuca drymeja* forms dense clumps; acidophilous species as *Deschampsia flexuosa*, *Oxalis acetosella* are missing of the phytocenosis and occurring several mesotrophic species: *Actaea spicata*, *Campanula rapunculoides*, *Dentaria bulbifera*, *Galium odoratum*, *Monotropa hypophegea* etc.

- phytocenosis of as. *Hieracio rotundati-Fagetum* (Vida 1963) Täuber 1987 (syn.: *Luzulo-Fagetum* auct. roman., *Fagetum dacicum luzuletosum* Beldie 1951, *Deschampsio flexuosae-Fagetum* Soó 1962), the species *Hieracium transylvanicum* is replaced in the territory with *Hieracium murorum*. Phytocenosis install on steep slopes, degraded, with strongly leached soil, usually of the edges of forest roads passing on the narrow valleys. In these phytocenosis abound acidophilic species that *Deschampsia flexuosa*, *Luzula albida*. As the slope is attenuated and creates a small plateau, these phytocenosis are replaced by those of as. *Festuco drymejae-Fagetum*.

Such phytocenosis were identified in the forest Camena, on Camena Valley, under rocks from

Camena, forests: Poiana Mică, Ciolanul Mare, Piatra Gornătenilor, Coșuștea Valley (Dâlbocița, to the source of Coșuștea River), Coșuștea Ridge (to limit with the Domogled-Valea Cernei National Park), Isverna - over Potcoava, forests from Furca Lupșei.

#### **Physiognomy and structure**

The trees layer: dominated by the *Fagus sylvatica*. Sporadic *Abies alba*. Sparse: *Acer campestre*, *Acer platanoides*, *Quercus dalechampii*, *Carpinus betulus*.

The shrubs layer: *Corylus avellana*, *Crataegus monogyna*, *Daphne mezereum*, *Lonicera xylosteum*, *Sorbus aucuparia* - juveniles.

The herbaceous layer: *Anemone nemorosa* subsp. *nemorosa*, *Arum maculatum*, *Asarum europaeum*, *Calamagrostis arundinacea*, *Campanula persicifolia*, *C. rapunculoides*, *Carex pilosa*, *Dentaria bulbifera*, *Digitalis grandiflora*, *Dryopteris filix-mas*, *Euphorbia amygdaloides*, *E. stricta*, *Festuca drymeja*, *F. heterophylla*, *Fragaria vesca*, *Galium odoratum*, *G. rotundifolium*, *Glechoma hirsuta*, *Hieracium murorum*, *Hordelymus europaeus*, *Lamium galeobdolon*, *Lathyrus venetus*, *L. vernus*, *Libanotis montana*, *Lilium martagon*, *Luzula luzuloides*, *Melica uniflora*, *Mercurialis perennis*, *Moehringia trinervia*, *M. muscosa*, *Monotropa hypophegea*, *Mycelis muralis*, *Oxalis acetosella*, *Peltaria alliacea*, *Pteridium aquilinum*, *Poa nemoralis*, *Polygonatum verticillatum*, *Sanicula europaea*, *Scrophularia nodosa*, *Stachys sylvatica*, *Symphytum tuberosum*, *Rubus hirtus*, *Tanacetum corymbosum*, *Thalictrum aquilegifolium*, *Vaccinium myrtillus*, *V. vitis-idaea*, *Verbascum densiflorum*, *Veronica officinalis*, *V. urticifolia*.

**Contact habitats:** 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*), 91L0 Illyrian oakhornbeam forest (*Erytronio-Carpinion*) and 9150 Medio-European limestone beech forest of the *Cephalanthero-Fagion*.

**Ecological and biological value** – low conservation value [18].

**Species from the National Red Lists:** in phytocoenosis neighboring from the habitat 91K0 se frequently found *Peltaria alliacea*.

**Habitat 9150 Medio-European limestone beech forest of the *Cephalanthero-Fagion*** represented by Romanian habitat R4111 Southeast Carpathian beech forests (*Fagus sylvatica*) with and fir tree (*Abies alba*) with *Cephalanthera damasonium*, whose **correspondence with European classification systems** are the following: EMERALD - !41.1 Beech forest; CORINE - , PAL. HAB. - 41.1D41 Dacian *Epipactis* beech forest; EUNIS - G1.6D4 East Carpathian calciphile beech forest.

**General description** – is represented by the beech forests belonging to *Fagetalia sylvaticae* Pawłowski in Pawłowski et al. 1928 class: xerothermophilic beech forests, *Fagus sylvatica* dominated species, developed on calcareous, frequently

superficial soils, often on steep slopes, with the orchids of the genera *Epipactis* and *Cephalanthera* (*Cephalanthera damasonium* characteristic species).

**Stationary particularities** – develops on slopes with different inclinations and exhibits, trails, footpaths, plates, accompanying the Jurassic limestone bar of the Danube autochthonous, held on the the NE - SW; the substrate is composed of limestone rocks, calcareous sandstones, conglomerates and Mesozoic magmatic intrusions.

**Phytosociologic correspondence, variability and distribution in the territory.** Represented by:

- Southeast Carpathian beech forests with *Cephalanthera damasonium*, pure beech forests edified by as. *Epipactidi-Fagetum* 1972 (*Cephalanthero-Fagetum* auct. roman. non Oberd. 1957), which brings together beech forests from the high hilly area, installed on the gently or moderately sloping lands, on the humid and dry soils, with poor nutrients content. Identified at Cornetu Coșuștei, Coșuștea Ridge, Cornul Plânsului (Godeanu), and Vârtoape forest;

- beech and hornbeam forests at the base of the slopes from the mountain lower level, installed on brown soils or rendzinic, with the medium or pronounced trophicity, edified by as. *Carpino-Fagetum* subas. *cephalantheretosum* Coldea 1975. There have been identified in the area Topolnița Cave - Topolnița Gorges.

#### **Physiognomy and structure**

##### **a. Habitats represented by as. *Epipactidi-Fagetum***

The trees layer: dominated by the *Fagus sylvatica*. Sporadic *Abies alba*. Quite frequently may appear *Acer pseudoplatanus* and sporadic *Fraxinus excelsior*.

The shrubs layer: *Corylus avellana*, *Daphne mezereum*, *Fraxinus ornus*, *Sorbus aucuparia* - juveniles, *Spiraea chamaedryfolia*, *Viburnum lantana*.

The herbaceous layer: *Actaea spicata*, *Anemone nemorosa* subsp. *nemorosa*, *Asplenium scolopendrium*, *Arabis procurrens*, *Arum maculatum*, *Asarum europaeum*, *Asperula capitata*, *A. taurina*, *A. tinctoria* subsp. *hungarorum*, *Asplenium ceterach*, *A. ruta-muraria*, *A. trichomanes*, *Athyrium filix-femina*, *Brachypodium sylvaticum*, *Bromus benekenii*, *Campanula persicifolia*, *C. rapunculoides*, *Carex pilosa*, *C. spicata*, *Cephalanthera damasonium*, *C. rubra*, *Dentaria bulbifera*, *Dianthus petraeus*, *Digitalis grandiflora*, *Draba lasiocarpa*, *Dryopteris filix-mas*, *Epipactis helleborine*, *E. atrorubens*, *Euphorbia amygdaloides*, *Festuca heterophylla*, *Fragaria vesca*, *Galium odoratum*, *G. schultesii*, *G. purpureum*, *Geranium macrorrhizum*, *Hedera helix*, *Hepatica nobilis*, *Heracleum sphondylium*, *Hordelymus europaeus*, *Lamium album*, *L. galeobdolon*, *Lathyrus venetus*, *L. vernus*, *Melica uniflora*, *Melittis melissophyllum*, *Mercurialis perennis*, *Moehringia pendula*, *M. trinervia*, *Mycelis muralis*, *Neottia nidus-avis*, *Poa nemoralis*, *Primula veris* subsp. *columnae*,

*Platanthera bifolia*, *Poa nemoralis*, *Polygonatum verticillatum*, *Polypodium vulgare*, *Polystichum setiferum*, *Pulmonaria officinalis*, *Ruscus hypoglossum*, *Sanicula europaea*, *Saxifraga rotundifolia*, *Scutellaria altissima*, *Sedum hispanicum*, *Silene heuffelii*, *S. nutans* subsp. *dubia*, *Solidago virgaurea*, *Stellaria holostea*, *Symphytum tuberosum*, *Tamus communis*, *Tanacetum corymbosum*, *Valeriana officinalis*.

These phytocenosis installs on calcareous conglomerates, thus explaining the presence of characteristic and common species of some habitats as *Geranio macrorrhizi-Fagetum* (*Geranium macrorrhizum*) and the calcareous scree, or calcareous rocky slopes with chasmophytic vegetation (*Asplenium ceterach*, *A. ruta-muraria*, *A. trichomanes*, *Dianthus petaeus*, *Draba lasiocarpa*, *Moehringia pendula*, *M. trinervia*, *Poa molinerii*, *P. nemoralis*).

**b. Habitats represented by as. *Carpino-Fagetum* subas. *cephalantherietosum***

The trees layer: dominated by *Fagus sylvatica*, in phytocenosis at Topolnița and *Carpinus betulus*. Sporadic - *Acer pseudoplatanus*.

The shrubs layer: *Corylus avellana*, *Fraxinus ornus*, *Sorbus aucuparia* (juveniles), *Syringa vulgaris*, *Viburnum lantana*.

The herbaceous layer: *Anemone nemorosa* subsp. *nemorosa*, *Arum maculatum*, *Asarum europaeum*, *Asplenium ceterach*, *Brachypodium sylvaticum*, *Bromus benekenii*, *Campanula persicifolia*, *C. rapunculoides*, *Carex pilosa*, *Cephalanthera damasonium*, *Dentaria bulbifera*, *Digitalis grandiflora*, *Dryopteris filix-mas*, *Epipactis helleborine*, *Euphorbia amygdaloides*, *Fragaria vesca*, *Galium odoratum*, *G. schultesii*, *Hepatica nobilis*, *Lamium galeobdolon*, *Lathyrus venetus*, *L. vernus*, *Luzula forsteri*, *Melica uniflora*, *Mycelis muralis*, *Poa nemoralis*, *Polystichum setiferum*, *Sanicula europaea*, *Scutellaria altissima*, *Sedum hispanicum*, *Solidago virgaurea*, *Symphytum tuberosum*, *Tamus communis*, *Tanacetum corymbosum*, *Valeriana officinalis*.

**Contact habitats**: 9110 *Luzulo-Fagetum* beech forests; 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*); 40A0\* Subcontinental peri-Pannonic scrub; 8210 Calcareous rocky slopes with chasmophytic vegetation.

**Ecological and biological value** – low conservation value [18].

**The criterion Aii corresponding plant species for selecting types of Natura 2000 sites**: European endangered species listed in the Habitats Directive Annexes IIB and IVb + Berne Convention - App I whose conservation requires the designation of Special Areas of Conservation – SAC: *Ruscus hypoglossum*.

**The criterion b Aiv corresponding plant species for selecting 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*, *Silene nutans* subsp. *dubia*.

**Species from the National Red Lists**:

*Cephalanthera damasonium*, *C. rubra*, *Epipactis atrorubens*, *E. helleborine*, *Hepatica nobilis*, *Neottia nidus-avis*.

**Habitat 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*)** represented in the area by Romanian habitat, **corresponding of European classification systems** as follows:

- R4112 The Balkans beech forests (*Fagus sylvatica*) with *Aremonia agrimonoides*: EMERALD – !41.1 Beech forests, CORINE – , PAL.HAB. – 41.1D51 South Carpathian *Aremonia* beech forest, EUNIS – G1.6D51 South Carpathian *Aremonia* beech forest.

- R4115 The Balkans beech forests (*Fagus sylvatica*) with *Geranium macrorrhizum*: EMERALD – !41.1 Beech forests, CORINE – , PAL.HAB. – 41.4643 South Carpathian *Geranium macrorrhizum* beech forest, EUNIS – .

- R4121 The Balkans beech forests (*Fagus sylvatica*) and Turkish hazel (*Corylus colurna*) with *Knautia drymeia*: EMERALD – !41.1 Beech forests, CORINE – , PAL.HAB. – 41.1D52 South Carpathian *Corylus colurna* beech forest, EUNIS G1.6D52 South Carpathian *Corylus colurna* beech forest.

**General description** – is represented by the beech forests belonging to *Fagetalia sylvaticae* Pawłowski in Pawłowski et al. 1928 class: subtermophilic beech forests, which represents a transition between the Carpathian beech forests (*Symphyto-Fagion*) and the Illyrian (*Aremonio-Fagion*). The edifying habitat species are: *Fagus sylvatica*, *Carpinus betulus*, and and for the *c* variant - *Corylus colurna* and *Tilia tomentosa*. The characteristic species: *Aremonia agrimonoides*, *Corylus colurna*, *Festuca drymeja*, *Geranium macrorrhizum*.

**Stationary particularities** – develops on slopes with different inclinations and exhibits, plates, ridges; the substrate is composed of limestone rocks, calcareous sandstones, conglomerates and Mesozoic magmatic intrusions.

**Phytosociologic correspondence, variability and distribution in the territory**. Represented by Romanian variants:

a. R4112 The Balkans beech forests (*Fagus sylvatica*) with *Aremonia agrimonoides* edified by as. *Aremonio agrimonoidi-Fagetum* Boșcaiu 1971 in Resmerița 1972 (*Fagetum banaticum* Borza 1931). Identified at Coșuștea Ridge, Ciolanu Mare Mountain, Camena;

b. R4115 The Balkans beech forests (*Fagus sylvatica*) with *Geranium macrorrhizum* edified by as. *Geranio macrorrhizi-Fagetum* (Borza 1933) Soó 1964, which is part of the al. *Peltarion alliacea* after Boșcaiu (1971) [5]. As the only recognition species of this al. to new is *Peltaria alliacea*, Sanda et al. 2001 include the

as. at *Aremonio agrimonoidi-Fagetum* Boşcaiu 1971 in Resmeriță 1972. Identified at Mehedinți Mountain Ridge, starting at Camena to Crovul lui Gherghină, Piatra Coșuștei, Culmea Coșuștei, Isverna over Potcoava, Valea Domnișoarelor, forests from Godeanu (Piatra Plânsului), Gorganu Valley, Vârtoape;

c. R4121 The Balkans beech forests (*Fagus sylvatica*) and Turkish hazel (*Corylus colurna*) with *Knautia drymeia*: edified by as. *Corylo colurnae-Fagetum* (Jov. 1955) Borhidi 1963. Identified from Culmea Gorganu, forests Drăghiceanu and Vârtoape.

Because most Illyrian characteristic species missing from Romania, and the as. *Aremonio-Fagetum* does not have any characteristic Illyrian species (therefore was recently classified by some authors in al. *Symphyto-Fagion.*), regional al. *Fagion banaticum* Borza 1931 as transition alliance between Carpathian beech forests and the Banat, would coincide to some measure with the *Fagion illyricum* Horvat 1931, which should be homologated (at least partially) with *Aremonio-Fagion* Salvatore 1964 [5].

#### Physiognomy and structure

##### a. R4112 The Balkans beech forests (*Fagus sylvatica*) with *Aremonia agrimonoides*

The trees layer: dominated by the *Fagus sylvatica*. Sporadic *Fraxinus excelsior* and *Acer pseudoplatanus*.

The shrubs layer: *Daphne mezereum*, *Corylus avellana*, *Sambucus nigra*, *Crataegus monogyna*, *Lonicera xylosteum*, *Sorbus aucuparia* (juveniles), *Spiraea chamaedryfolia*.

The herbaceous layer: *Ajuga reptans*, *Alliaria petiolata*, *Anemone nemorosa* subsp. *nemorosa*, *A. ranunculoides*, *Arabis turrita*, *Aremonia agrimonoides*, *Arum maculatum*, *Asarum europaeum*, *Asperula tinctoria* subsp. *hungarorum*, *A. taurina*, *Asplenium trichomanes*, *Astragalus glycyphyllos*, *Athyrium filix-femina*, *Brachypodium sylvaticum*, *Campanula greskii*, *C. persicifolia*, *C. rapunculoides*, *Cephalanthera rubra*, *Corydalis solida* subsp. *solida*, *Dentaria bulbifera*, *Dryopteris filix-mas*, *Epipactis helleborine*, *Euphorbia amygdaloides*, *E. epithymoides*, *Festuca drymeja*, *Fragaria vesca*, *Galium kitaibelianum*, *G. odoratum*, *G. schultesii*, *Geranium macrorrhizum*, *G. robertianum*, *Glechoma hirsuta*, *Helleborus purpurascens*, *Hepatica nobilis*, *Hordelymus europaeus*, *Lamium galeobdolon*, *Lathyrus hallersteinii*, *L. latifolius*, *L. vernus*, *Lilium martagon*, *Melitis melisophyllum*, *Mercurialis perennis*, *Moehringia muscosa*, *M. trinervia*, *Mycelis muralis*, *Myosotis sylvatica*, *Myrrhoides nodosa*, *Origanum vulgare*, *Orobancha alba* pe *Origanum vulgare*, *Orobancha caryophyllacea* pe *Asperula tinctoria*, *Oxalis acetosella*, *Peucedanum austriacum*, *Platanthera bifolia*, *Poa nemoralis*, *Polygonatum latifolium*, *Potentilla micrantha*, *Primula veris* subsp. *columnae*, *P. vulgaris*, *Ranunculus ficaria* subsp. *bulbilifer*, *Rubus hirtus*, *Sanicula europaea*,

*Symphytum tuberosum*, *Tanacetum corymbosum*, *T. macrophyllum*, *Thalictrum aquilegifolium*, *Veronica jaquinii*, *V. officinalis*, *V. urticifolia*, *Vincetoxicum hirundinaria* subsp. *hirundinaria*, *Viola canina* subsp. *ruppii*, *V. reichenbachiana*.

##### b. R4115 The Balkans beech forests (*Fagus sylvatica*) with *Geranium macrorrhizum*

The trees layer: dominated by the *Fagus sylvatica* and sporadic: *Acer pseudoplatanus*, *Fraxinus excelsior*, *Sorbus aucuparia*.

The shrubs layer: *Daphne mezereum*, *Corylus avellana*, *Euonymus verrucosus*, *Fraxinus ornus*, *Sambucus nigra*, *Crataegus monogyna*, *Lonicera xylosteum*, *Spiraea chamaedryfolia*.

The herbaceous layer: *Anemone nemorosa*, *Aremonia agrimonoides*, *Arabis turrita*, *Arabis procurrens*, *Asarum europaeum*, *Asplenium ceterach*, *A. scolopendrium*, *A. trichomanes*, *Brachypodium sylvaticum*, *Bromus riparius*, *Circaea lutetiana*, *Cystopteris fragilis*, *Dactylis glomerata*, *Digitalis ferruginea*, *Doronicum columnae*, *Epipactis atrorubens*, *Galium odoratum*, *Geranium macrorrhizum*, *G. phaeum*, *G. robertianum*, *Galium schultesii*, *Gymnocarpium robertianum*, *Heracleum sphondylium*, *Lamium galeobdolon* subsp. *galeobdolon*, *Lunaria annua pachyrhiza*, *Mycelis muralis*, *Seseli libanotis*, *Lychnis coronaria*, *Melissa officinalis*, *Melittis melisophyllum*, *Mercurialis perennis*, *Oxalis acetosella*, *Parietaria officinalis*, *Peltaria alliacea*, *Poa nemoralis*, *Polystichum aculeatum*, *Potentilla micrantha*, *P. reptans*, *Pulmonaria officinalis*, *Salvia glutinosa*, *Scutellaria altissima*, *Sedum maximum*, *Senecio rupestris*, *Urtica dioica*, *Viola reichenbachiana*.

##### c. R4121 The Balkans beech forests (*Fagus sylvatica*) and Turkish hazel (*Corylus colurna*) with *Knautia drymeia*

The trees layer: dominated by the *Fagus sylvatica*, codominant *Corylus colurna*, sporadic: *Acer pseudoplatanus*, *Carpinus betulus*, *Fraxinus ornus*, *Tilia tomentosa*, *Sorbus domestica*.

The shrubs layer: *Cornus mas*, *Crataegus monogyna*, *Ligustrum vulgare*, *Rosa canina*, *R. pendulina*, *Sambucus nigra*, *Viburnum lantana*.

The herbaceous layer: *Asperula taurina*, *Asarum europaeum*, *Arabis turrita*, *Anthriscus sylvestris*, *Brachypodium sylvaticum*, *Coronilla varia*, *Campanula rapunculoides*, *C. persicifolia*, *Dactylis polygama*, *Dentaria bulbifera*, *Euphorbia amygdaloides*, *Knautia drymeia*, *Lathyrus venetus*, *Melampyrum bihariense*, *Melica uniflora*, *Moehringia trinervia*, *Potentilla micrantha*, *Peltaria alliacea*, *Poa nemoralis*, *Scutellaria altissima*, *Stellaria nemorum*, *Thalictrum aquilegifolium*, *Viola reichenbachiana*.

**Contact habitats**: 91E0\* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*); 9110 *Luzulo-Fagetum* beech forests; 9150 Medio-European limestone beech forest of the *Cephalanthero-Fagion*; 91L0 Illyrian

oakhornbeam forest (*Erythronio-Carpinion*); 40A0\* Subcontinental peri-Pannonic scrub; 8210 Calcareous rocky slopes with chasmophytic vegetation; 8160\* Medio-European calcareous screes of hill and montane levels.

**Ecological and biological value** – high conservation value [18].

**Species from the National Red Lists:**

*Cephalanthera rubra*, *Corylus colurna*, *Epipactis atrorubens*, *E. microphyllum*, *Epipactis helleborine*, *Mercurialis ovata*, *Myrrhoides nodosa*, *Peltaria alliacea*, *Piptatherum virescens*, *Tanacetum macrophyllum*.

**Habitat 91L0 Illyrian oakhornbeam forest**

(*Erythronio-Carpinion*) – represented by Romanian habitat R4127 Dacian mixed oak (in territory *Quercus dalechampii*), beech (*Fagus sylvatica*) and silver lime (*Tilia tomentosa*) forests with *Erythronium dens-canis*, whose **correspondence with European classification systems** are the following: EMERALD – !41.2 Oak-hornbeam forests; CORINE –; PAL. HAB. – 41.2A12 Illyrian neutrocline sessile oakhornbeam forests; EUNIS – G1.A164 Peri-Carpathian lime - oak - hornbeam forest.

**General description** – is represented by the *Quercus dalechampii* forests, sometimes also *Carpinus betulus*, extrazonal in România. Oak and hornbeam Forests of Mehedinți Plateau represents a transition between goruneto Dacian oak-hornbeam forests (*Lathyro hallersteinii-Carpinion*) and the Illyrian (*Erythronio-Carpinion*); these forests are intermediate between oak and hornbeam (eg. 9170) from Central Europe and the Balkans and merge to the north with the Pannonian oak forests (91G0). The characteristic species of the habitat is *Erythronium dens-canis*.

**Stationary particularities** – are found exclusively on carbonate substrates, especially the deep brown forest soils (luvic brown, brown acid, neutral to slightly acidic, with quality humus. It is installed on slopes with low inclination, so the bottoms of valleys and on ridges.

**Phytosociologic correspondence, variability and distribution in the territory.** Habitat is not edified for a specific association, but by the mixtures of oak (*Quercus dalechampii*), beech (*Fagus sylvatica*), hornbeam (*Carpinus betulus*), silver lime (*Tilia tomentosa*) with *Asperula-Asarum-Stellaria*.

Such forests have been identified in Pistrița, Cornetul Băii, Coșuștea, Bahna, Jupânești, zona Cireșu (Pețime la sorb), Schitul Topolnița.

We describe two of the most representative plant communities in the territory.

**Physiognomy and structure**

a) The forests from Cornetul Băii

**The trees layer:** dominated by the *Quercus dalechampii*, *Carpinus betulus* and dispersed: *Acer campestre*, *Acer pseudoplatanus*, *Castanea sativa*,

*Fagus sylvatica*, *Fraxinus excelsior*, *Pseudotsuga menziesii* (cult.), *Prunus cerasus*, *Sorbus torminalis*.

**The shrubs layer:** dominated by the *Cornus sanguinea* and dispersed: *Cornus mas*, *Corylus avellana*, *Cotinus coggygia*, *Euonymus verrucosus*, *Fraxinus ornus* (sometimes more sapling), *Juniperus communis*, *Ligustrum vulgare*, *Syringa vulgaris*, *Sambucus nigra*, *Crataegus monogyna*.

**The undergrowth layer:** *Clematis vitalba*, *Cytisus nigricans*, *Rubus hirtus*, *Ruscus aculeatus*.

**The herbaceous layer:** *Ajuga reptans*, *Alliaria petiolata*, *Aremonia agrimonoides*, *Arum maculatum*, *A. orientale*, *Asarum europaeum*, *Asperula taurina*, *A. odorata*, *Asplenium trichomanes*, *A. ruta-muralis*, *Astragalus glycyphyllos*, *Atropa bella-donna*, *Bellis perennis*, *Betonica officinalis*, *Brachypodium sylvaticum*, *Campanula persicifolia*, *C. rapunculoides*, *Calamintha sylvatica*, *Carex pilosa*, *Cephalanthera rubra*, *Corydalis solida* subsp. *solida*, *Crocus* sp., *Cruciata glabra*, *C. laevipes*, *Dactylis glomerata*, *Dentaria bulbifera*, *Dryopteris filix-mas*, *Epipactis microphyllum*, *Euphorbia amygdaloides*, *E. platyphyllos*, *Festuca drymeja*, *Festuca gigantea*, *F. heterophylla*, *Fragaria vesca*, *Galium pseudoaristatum*, *G. schultesii*, *Geranium robertianum*, *Geum urbanum*, *Glechoma hirsuta*, *Gnaphalium sylvaticum*, *Hedera helix*, *Helleborus purpurascens*, *Hieracium sabaudum*, *Hordelymus europaeus*, *Lamium galeobdolon*, *L. maculatum*, *Lathyrus vernus*, *Lilium martagon*, *Listera ovata*, *Lythospermum purpureo-caeruleum*, *Melica uniflora*, *Moehringia trinervia*, *Ophioglossum vulgatum*, *Orchis purpurea*, *Ornithogallum umbellatum*, *Parietaria officinalis*, *Piptatherum virescens*, *Poa nemoralis*, *Polygonatum latifolium*, *P. odoratum*, *Polystichum setiferum*, *Potentilla micrantha*, *Pulmonaria officinalis*, *Ranunculus auricomus*, *R. ficaria* subsp. *bulbilifer*, *Sanicula europaea*, *Salvia glutinosa*, *Scilla bifolia*, *Silene nemorosa*, *Solidago virgaurea*, *Stellaria media*, *Symphytum tuberosum*, *Tamus communis*, *Vincetoxicum hirundinaria* subsp. *hirundinaria*, *Viola canina* subsp. *ruppii*, *V. reichenbachiana*.

The forests from Topolnița (Pețime la sorb, Găuriniți)

**The trees layer:** *Acer campestre*, *A. platanoides*, *A. pseudoplatanus*, *Carpinus betulus*, *Fagus sylvatica*, *Fraxinus excelsior*, *Fraxinus ornus*, *Malus sylvestris*, *Prunus avium*, *Pyrus pyraeaster*, *Quercus dalechampii*, *Sorbus torminalis*, *Tilia platyphyllos*, *T. tomentosa*, *Ulmus glabra*.

**The shrubs layer:** developed variable, composed from *Carpinus orientalis*, *Corylus avellana*, *Cornus mas*, *Cornus sanguinea*, *Crataegus monogyna*, *Evonymus europaeus*, *Sambucus nigra*, *Syringa vulgaris*, *Rosa canina*.

**The herbaceous layer:** *Adoxa moschatelina*, *Ajuga genevensis*, *Alliaria petiolata*, *Anemone ranunculoides*, *A. sylvestris*, *Arabis turrata*, *Aremonia agrimonoides*, *A. maculatum*, *Arum orientale*, *Asarum*

*europaeum*, *Asperula taurina*, *Asplenium ceterach*, *A. trichomanes*, *Astragalus glycyphyllos*, *Brachypodium sylvaticum*, *Bromus benekenii*, *Campanula persicifolia*, *C. rapunculoides*, *Carex sylvatica*, *C. pilosa*, *Corydalis solida* subsp. *solida*, *Crocus banaticus*, *Cystopteris fragilis*, *Dactylis glomerata*, *Delphinium fissum* subsp. *fissum*, *Dentaria bulbifera*, *Doronicum columnae*, *Erythronium dens-canis*, *Euphorbia amygdaloides*, *Fragaria vesca*, *Gagea lutea*, *G. pratensis*, *Galium odoratum*, *G. schultesii*, *Geranium lucidum*, *G. macrorrhizum*, *G. robertianum*, *Geum urbanum*, *Glechoma hirsuta*, *Helleborus purpurascens*, *Hepatica nobilis*, *Hieracium pavichii*, *Isopyrum thalictroides*, *Lactuca viminea*, *Lamium galeobdolon*, *L. maculatum*, *Lapsana communis* subsp. *intermedia*, *Lathraea squamaria*, *Lathyrus vernus*, *L. venetus*, *Lilium martagon*, *Lunaria annua* subsp. *pachyrrhiza*, *Luzula forsteri*, *Moehringia trinervia*, *Mercurialis ovata*, *Mycelis muralis*, *Orchis purpurea*, *Oxalis acetosella*, *Piptatherum virescens*, *Polygonatum latifolium*, *Potentilla reptans*, *Pulmonaria officinalis*, *Ranunculus auricomus*, *R. ficaria* subsp. *bulbilifer*, *Sanicula europaea*, *Saxifraga rotundifolia*, *Scrophularia nodosa*, *Stellaria holostea*, *Symphytum tuberosum*, *Tanacetum corymbosum*, *Thlaspi perfoliatum*, *Urtica dioica*, *Veronica hederifolia*, *V. persica*, *Vinca minor*, *Viola alba*, *V. hirta*, *V. odorata*, *V. reichenbachiana*.

**Contact habitats:** 91E0\* Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*); 40A0\* Subcontinental peri-Pannonic scrub; 8210 Calcareous rocky slopes with chasmophytic vegetation; 91K0 Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*).

**Ecological and biological value** – moderate conservation value [18].

**The criterion Aii corresponding plant species for selecting types of Natura 2000 sites:** European endangered species listed in the Habitats Directive Annexes IIb and IVb + Bern Convention – App I, whose conservation requires the designation of Special Areas of Conservation – SAC and **criterion Av** as a plant species of community interest of which taking from the wild and exploitation are likely to be subject to management measures: *Ruscus aculeatus*.

**Species from the National Red Lists:** *Delphinium fissum* subsp. *fissum*, *Erythronium dens-canis*, *Hepatica nobilis*, *Lactuca viminea* subsp. *viminea*, *Lapsana communis* subsp. *intermedia*, *Listera ovata*, *Lunaria annua* subsp. *pachyrrhiza*, *Luzula forsteri*, *Mercurialis ovata*, *Orchis purpurea*, *Piptatherum virescens*, *Tanacetum macrophyllum*.

## Discussions

It is known that natural regeneration of forests depends on the influence of environmental factors (climatic, edaphic). This natural generative regeneration (from seeds) is very important in terms of conservation are being promoted because the species of

local origin. In Illyrian oakhornbeam forest (*Erythronio-Carpinion*) found a strong natural regeneration hornbeam, manna ash, and beech here and there. In *Luzulo-Fagetum* beech forests the beech regenerates strongly naturally, and in Illyrian *Fagus sylvatica* forests (*Aremonio-Fagion*) natural regeneration we observed at *Abies alba*, *Acer pseudoplatanus*, *Sorbus aucuparia*, *Fraxinus ornus*, and less from *Fagus*. Concerning the Medio-European limestone beech forest of the *Cephalanthero-Fagion* habitat, at the variant *Epipactidi-Fagetum* not observed natural regeneration of the beech, perhaps because it is developed on rocky substrate with poor soil in nutrient. At the variant *Carpino-Fagetum* subas. *cephalantherietosum* natural regeneration was observed at *Fagus sylvatica*, *Carpinus orientalis* and *Quercus dalechampii*.

**The disturbing factors** for the nemoral habitats presented are represented by the intensive forestry management, too short production cycle, deforestation, atmospheric pollution, reforestation with other wood essences than those typical sites, a high density of wild game, which prevent for gnawing regeneration of young stems.

**The potential threats** - anthropic - extraction of economic value species of, eg. *Fagus sylvatica*, would cause disruption of forests composition in favor of the hornbeam. Therefore, it could decrease the protective capacity of the new arboretums. The potential threats may occur in relation to non compliance with operating procedures, where soil damage and destruction of seedlings and herbaceous layer exceeding normal limits. Depending on these factors applies enhanced measures to control or even removal from the production of parts of habitats with high conservation values.

In natural conditions these habitats do not require special management. Natural habitats are located on the Natura 2000 site - protected areas. The areas occupied by these forest types should not undergo silvicultural interventions. In the case of too high densities of wild game (rafters) applies a management of wild game to safeguard the equilibrium the forest and to ensure natural regeneration.

## Conclusions

1. Analyzing physiognomy and habitat structure we consider their condition as favorable.
2. We believe that in territory habitats 9150 Medio-European limestone beech forest of the *Cephalanthero-Fagion* and 91L0 Illyrian oakhornbeam forest (*Erythronio-Carpinion*) have high conservation value conserving species of European interest, endemic species and many species of orchids.

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43. \*\*\* Raport final - Evaluarea diversității biologice și a stării de conservare în vederea realizării bazei de date Natura 2000 în Geoparcul Platoul Mehedinți, București, 2007.